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[*Authors alone are responsible for the contents of their respective Papers.*]

FIELD-MARSHAL THE RIGHT HONOURABLE FREDERICK SLEIGH, EARL ROBERTS,

K.G., K.P., G.C.B., G.C.S.I., G.C.I.E., V.C., Commander-in-Chief.

Born in India, 30th September, 1832; educated at Eton, Sandhurst, and Addiscombe.

Entered the Army as Second Lieutenant, 12th December, 1851; promoted to Major-General, 31st December, 1878; Lieut.-General, 26th July, 1883; General, 28th November, 1890; and Field-Marshal, 25th May, 1895.

Served in the Indian Mutiny Campaign, 1857-58, where he earned the Victoria Cross; North-West Frontier of India Expedition, 1863, on special service; Abyssinian Expedition, 1868, and superintended the re-embarkation of the entire army; Looshai Expedition, 1871-72; Afghan War, 1878-80, and commanded the Kuram Field Force in 1878-79, and the army in 1879-80; Burmese Expedition, 1886, and commanded the army after the capture of Mandalay; and in South Africa, 1899-1900, in command of the forces. Has been wounded, has been more than twenty times mentioned in despatches, and has received the thanks of both Houses of Parliament, the Government of India, and the Governor-General in Council.

Was Commander-in-Chief in India, 1885-1893; and was appointed Commander-in-Chief of the British Army, 3rd January, 1901.

Created a Baronet, 1881; a Baron, 1892; and was raised to an Earldom, 1901.

ARMY REFORM BASED ON SOME 19TH CENTURY LESSONS IN WARFARE.

By Major-General C. E WEBBER, C.B., p.s.c., late R.E.

Wednesday, February 20th, 1901.

Captain Sir J. COLOMB, K.C.M.G., M.P. (late R.M.A.), in the Chair.

WHEN a writer feels himself very full of his subject he is apt to find a difficulty in selecting a title. Such has been my case, and the title I have given to these few remarks may appear too ambitious. I confess that it has been a difficulty. If those matters to which I shall allude in this address could be regarded as texts to other papers by the many students of war who belong to this Institution, my attempt would indeed be fortunate; if I can secure the careful attention of such authorities to the vital questions which I propose to raise, I shall be more happy; and if this arena of discussion may be regarded as the best place where such matters of vital importance can be practically considered, and if those whose duty it is to guide the country in such matters should co-operate and condescend to learn something from our members, I shall be rewarded.

SCIENTIFIC STUDY OF WAR.

Broadly stated, my contention is that the scientific study of warfare during, at any rate, the latter half of the nineteenth century, has lagged far behind the advance in knowledge which the world has made in the same period; and that so far as the preparation for war has been concerned, while science has been improving the *matériel*, the organisation of the *personnel* and the instruction in its use to the best advantage, have not kept pace with that improvement. There can be no question whatever that, about the middle of the century, science, as having anything to do with warfare, had fallen into disrepute. The existence of a science of war which in some way meant the laws which governed the game, was tolerated. An officer who ventured to speak of "scientific warfare as an application in war of scientific knowledge" was laughed at.

There were many causes for this. Even Napoleon's methods were not understood by his Army as scientific, although unquestionably he was

a man of science. The inevitable deadly save-trouble period of peace encouraged those who leant on tradition. Economy always intervened to "let well alone." While civil life was acquiring knowledge and applying it by leaps and bounds, military life went to sleep.[1]

This was quite natural. Industry and commerce could put each advance of science to the test. Only occasionally did war give an opportunity for testing the old military machine, and then, so far as England was concerned, the tests were against enemies armed with the weapons of the previous century. The Crimean War had only the effect of standardising the experience gained against an enemy no better prepared and equipped than ourselves.

At that time commenced the period of framing many regulations, and of sealing patterns. Since then standardisation has weighed on, and influenced, every stage of military advancement. Those who have been responsible, while rightly clinging to the everlasting principles of warfare, have wrongly also clung to antiquated applications of them. The inevitable tendency to this has only (in some countries) been checked by the almost accidental elevation to positions of authority of men of scientific minds.

Curiously enough, one of the most scientific writers that non-military ranks have lately produced is a civilian, M. de Bloch, of Warsaw.[2] Before compiling my notes for this paper I had not seen his work, but I now warmly recommend its perusal to my audience. His chief object is to show that war is too suicidal to be possible. He believes that "the end of war is in sight," and "those who are preparing for war and basing all their schemes of life on the expectation of war, are visionaries of the worst kind, for war is no longer possible." He believes that in view of "the future of war, not fighting, but the prospect of famine; not the slaying of men, but the inevitable bankruptcy of nations, and the break-up of the whole social organisation," will prevail, through what he believes to be "common sense," to prevent nations going to war. The thesis of his very remarkable book is that war has become impossible "except at the price of suicide." At the same time, he "does not for a moment deny that it is possible for nations to plunge themselves and their neighbours into a frightful series of catastrophes which

[1] The adoption of the war-game as a means of instruction of officers and non-commissioned officers, may be pointed to in refutation of this statement, but if there is anything which can be described as unscientific it is the manner in which it has been used for purposes of instruction.

The so-called war-game is as unlike war as are our manœuvres, only it is less practical. In its very absence of resemblance to the reality in respect of the surface of the ground, it begins the instructions of the tyro at the wrong end. When he applies what he has learned he is bound to be misled by the unreal conditions represented by the flat surfaces on which he was taught.

I remember playing the first game ever seen in this country, against Major von Reardantz, the Prussian Military Attaché (I had learnt it in Berlin), before a very distinguished audience; Generals Cameron and Lennox were the umpires, and then the opinion was expressed of its being more suitable as an assistant to the expert than to the student.

[2] "Modern Weapons and Modern War," by I. S. Bloch.

would probably result in the overturn of all civilised and ordered government."

The weak side of all his argument is, that he will not admit of an appeal to precedents in the warfare of the past. At the same time, he explains that he does so because he believes that precedents no longer hold good in face of the vast powers which science has placed within the reach of man to apply to warfare, and in view of what he calls the social and economical changes made in life by "the modern industrial system."

But in view of the preparedness of other European nations, would any one of them be justified to trust, on M. de Bloch's advice, to the effect of "common sense" on their neighbour, through the fear that the social organism might be dislocated? Have we not seen all Europe stirred up by venal and gutter newspapers, and the honest wish of sober-minded men, to regard with impartiality the conscientious beliefs of their neighbours, almost obliterated, under the influence of passionate appeals to sentiment? If any question ever arises which will make a European people imagine that war is unavoidable, M. de Bloch admits that their "rulers will shut their eyes to its consequences."

It is not sufficient then to submit evidence, however plausible or elaborate, to prove that nations without bitter experience will be deterred from quarrelling for economic reasons, or because the cost of the apparatus of war is too scientific, and therefore prohibitive. If M. de Bloch could get European nations in times of peace to recognise the inevitable truths which he has with immense labour collected in his work, and to act on them, and to disarm, or reduce military expenditure to a minimum essential for police work, he would be the greatest benefactor to mankind that has yet appeared.[1]

Writers who agree with M. de Bloch argue that warfare has become impossible on account of its destructiveness. They, however, build their arguments on the organisation, equipment, classification—in a word, on the standardisation—of European Armies as they exist. They do not sufficiently study the question from the historical point of view. History would tell them that whenever destruction of human life in warfare became excessive, science intervened to save the waste of life, and, by altering the conditions, so helped the nation that was alive to what science could do, that it secured the preponderance of a peaceable policy, and for a while peace was maintained until new conditions arose.

European Armies are now existing on a traditional system of organisation which keeps them in a state of uncertainty as to its soundness. But the nations are just as likely to fall out and fight as of yore. For a time they may be held back by the evident truth of what M. de Bloch reminds them, but suddenly, or by degrees, some one Power will realise that their standardisation is faulty, will correct it, and with science as the true handmaid of warfare, will overthrow the others.

[1] I have often thought that if M. de Bloch could get all the War Offices in Europe to exchange their title for that of "Peace" Office, he might, in the end, attain his wish. Our own War Office has to legislate so largely in the direction of "peace at any price," I always call it in my own thoughts, the "Peace Office."

As to the British Empire, it has found, so far as its land forces are concerned, that the old patterns, slightly improved, have sufficed in her little annual wars. The instinctive power of self-organisation in the race is always saving her from a bad fall. The sea frontier and the Navy are a factor for the production of well-founded confidence up to a certain point, but beyond that point the want of common sense in our rulers (I include all estates of the realm clothed with any responsibility) is ghastly, from the point of view of the ordinary laws of self-preservation. On each occasion during the past century a serious war has found the country unprepared. It cannot be said that we have not had plenty of lessons on which to base Army Reform.

Business Principles.

Journalists and magazine writers, amongst them members of our Legislature, for instance, reiterate that the way to reform the Army is by introducing "ordinary business principles" into the working of our War Office, and that they (the business principles) have only to be followed in order to provide an efficient Army.[1]

I have no hesitation in asserting, as emphatically as I can, that in the *civil* administration of our public departments, whether for postal, naval, military, revenue, or legal requirements, the men employed are as good as any in the world, and that they do their work in an efficient and industrious manner which is second to none. I will add, they do it on far more accurate and scientific business principles than are to be found in ninety-nine out of a hundred of the great private businesses with which a great public office can be compared. If those writers, and would-be public guides, would make this conduct of public business a study, they might realise that to this very attempt to follow the lines of the practice of civil business in time of peace is due many of the miscarriages and much of the useless waste which occurs when war breaks out.

One great difference and reason for this contention may be mentioned here, namely, that a military administration in time of peace is preparing for an eventuality which only occasionally, and generally suddenly, arrives, and which, when it does arrive, appears in a form and from a direction, perhaps, quite different from the one that has been anticipated. When it does come, it is conducted under conditions to which ordinary business principles are wholly inapplicable. Those writers to whom I have referred seek to saddle the peace administration of our civilian military departments, so far as the creation and production of *matériel* of war is concerned, with the failures which occur in war, forgetting that *only* when war breaks out can the efficiency of the machine be tested. The probability is that the actual *business* connected with this production and supply is as faultless as can be.

[1] In the *Nineteenth Century* of July and August will be found remarks by several business men as to how "the lessons of the war" illustrate their views on the subject of preparing for and conducting war on what they call "ordinary business principles."

When, however, they add that you can build up the *personnel* of an Army in time of peace, on the ordinary business principles of civil life, namely, through the incidence of "personal responsibility," "payment by results," and "promotion by merit," they are talking nonsense, unless they engage to provide a real war between fairly even-sided combatants at least once in two years.

Amateur Warfare.

How indignant many of us are when we are told that we are a nation of *amateurs* in warfare, and yet there is some truth underlying this indefinite charge. I think, on the other hand, it can be shown that this very suggestion has equal foundation when applied to Continental Armies, with their compulsory service, and that there is more "amateuring" underlying their use of compulsory service than would be generally supposed. The nineteenth century experience of the compulsory service system is not altogether favourable.

Allow me to give one example of justification for the expression "amateur." The way in which Parliament has shown itself in the past careless of the manner in which the money they vote for military purposes is wasted, is strikingly exemplified in every measure which pretends to facilitate military manœuvres of a real character, so long as they withhold access to private lands off the public roads, etc.

It is one of the strongest evidence of the responsibility being entirely on the people's representatives, for the accusation against us in respect of real training, that we are "*amateurs*." Over the natural and artificial features of the land which we call "home" the soldier may never be exercised. It is an illusion to believe that the Military Manœuvres Act of 1897 was any real improvement on the previous Acts. I do not refer to the 3 or 4 areas, such as Salisbury Plain, over which troops can be trained all the year round. Not one of these areas is representative of 90 per cent. of the surface of the United Kingdom.

Now this is a thing that a plain business man *can* understand. What would he say if told that this Army is never in time of peace exercised, "across country," as the fox-hunter would call it?

Hedge-Row Warfare.

If you take any 6-inch map and lay on it in any direction a straight edge 6 inches long, you will find that in the open country the line will cross from 5 to 11 fences; the largest number will be found in Ireland.

In spite of Dr. Conan Doyle's assertion in his letters to the *Times*, these fences will not oblige an invading enemy to keep to the roads.[1]

[1] When Napoleon invaded a country, the high roads were devoted to the wheeled traffic, with a front of 3 to 5 vehicles, the infantry marched in open column on each side with a double company front, the cavalry marched outside the two infantry columns with double squadron fronts. How the *gros* of an invading army should march from the coast to London, leaving the roads to the heavy wheeled traffic, has been studied and settled in every War Office in Europe except ours.

The doctor has told the public that the fenced or enclosed nature of the surface of the United Kingdom "makes invasion impossible." He had just returned from a country (South Africa) where the conditions of the natural and artificial features of the surface of the land are (so to speak) at the other extremity of the scale and from this one observation he drew his rash conclusion. The European war student (I have discussed it with not a few) knows that the enclosed nature of this country is in favour of the attack, and not of the defence, and that no pure defence is possible until all the fences in front of a position have been swept away—a condition which every improvement of the projectile has emphasised.

Who will deny that our Army is controlled by "amateurs" when it is understood that in not one of our military districts[1] is there an enclosed area over which the General can give tactical lessons to teach his battalions, batteries, and companies what they would have to do in war?

Who will answer for the disasters that must inevitably follow against an invading enemy who knows and understands his advantage, namely, that he will be opposed by a force which has never had real field training across its own country? It is no use saying that it would be as new to the invading enemy, and that he would lose his way, as in a labyrinth. The leaders who invade this country will take care it is not new, and the alleged difficulty of troop guiding and leading in any given direction across an enclosed country is an idea only worthy of the town-bred writer, who never dared in his life to trespass off the high road.

I have hundred of times asked soldiers, and civilians, if they have ever considered this anomalous condition of things. Those who have realised its importance have invariably shirked the answer, and sheltered themselves behind[2] "violation of private rights," "cost," "injury to fences," "cultivation," etc.; and now we have a civilian doctor, who has been for a few months in South Africa with an ambulance, presuming on

[1] In March, 1872, the House of Commons had before it maps of the United Kingdom, showing Mr. Cardwell's depôt centres and the districts attached to them, 49 or 50, if I recall it rightly. There is no record if Mr. Cardwell's advisers realised the need to train the recruits outside the barrack square or field, over the enclosed country within reach of the depôt, or, if Mr. Cardwell, being advised that powers should be obtained over (say) 1,000 acres of enclosed land, near each of these depôts, urged his Government to include powers for that purpose in a Bill; or, if Mr. Cardwell did so, if his colleagues in the Cabinet declined to urge it in Parliament.

[2] When an Instructor in Topography at the R.M.A., 35 years ago, I devised a way of teaching Cadets to follow straight lines right across the enclosed country in the neighbourhood of Woolwich when making military sketches, a full description of which will be found in Vols. XIV. and XV. of the Professional Papers of the Corps of Royal Engineers. It was this teaching that enabled the Woolwich Cadets to give many points in rapid field sketching to Major Pettley's picked pupils amongst the Sandhurst Cadets. Thirty years ago I worked out the routes for six columns to march from the south coast on London without following the roads, which were left to the heavy wheeled traffic.

his celebrity as a story-writer, and telling his readers that the "bug-bear of invasion is for ever passed" because hedgerow defence is more than ever effective with modern arms. Exactly the reverse is the case.

Hedgerows, fences, or walls are stepping-stones, to the attack, and a disadvantage to the front of a defence. This example shows how open we lie to the accusation of being "amateurs." Those who are responsible, namely, the civilians, some in our Legislature, have been for twelve months telling the British officer that he is not educated enough. In the *Times*, of the 21st December last, a writer endorses a criticism that because our young officers "do not read enough history," they are inefficient as teachers of field training. What is the effect on the Army of this "amateur" control? Are not all regulations drawn up, and all patterns sealed, in time of peace, for manœuvring on roads, and never across country?[1] Does not this condition affect every lesson in tactical teaching with (so-called) field exercises and all the equipment, and everything upon which millions are spent in time of peace, only to be chucked aside, and too often (as I have seen) wantonly wasted in time of war?

Have not several military authorities stated that our failures in South Africa are due to the "absolute novelty of the conditions"? Is not this a very damning statement, if it is true that they were new (which it is not)? Or, if not being new, is it not more damning to have organised, trained, sealed, and regulated an army and its equipment, unfit to deal efficiently with those conditions?

Will the same authorities (a defence committee composed of civilians) say, when we have to fight over a closely enclosed country, that the failures (inevitable as they will be) are due also to the "absolute novelty of the conditions"? Only, then, as the conditions are always before them and not out of sight of Parliament as they have been in South Africa, will such a statement of a leader of the House of Commons[2] "that the Government had not adequately realised "that we had in South Africa to meet an enemy entirely mounted" be so meekly accepted.

A Manœuvre Bill.

That faint efforts have been made to increase the powers to use the surface of the country for a military training ground is shown by a Military Manœuvres Bill which the Secretary of State for War brought forward in 1900. It is hardly credible, but it is a fact, that it was thrown out in the House of Commons by the Standing Order Committee, on the ground that no notices had been served on owners or maps published of the areas.

It is true that if the Bill had been made general, *i.e.*, had given the Secretary of State for War power to make an order for the compulsory use

[1] On the unpractical nature of our manœuvres, see page 27 of a red pamphlet, called "A National Question, Army Re-organisation," published by Blackwood.

[2] Mr. Arthur Balfour at Manchester on the 10th January, 1900.

for military manœuvres of any lands in the United Kingdom, it could not have been rejected on a mere technical point; but it is marvellous that, at a moment when the country was crying out for the reform of the War Office, because of the alleged inefficiency of the Army, a measure which is at the A B C stage of efficient technical training, should have been wantonly cast aside by its representatives. Will anyone tell us that if even £20,000 a year had been spent in compensation for damages, while training soldiers and horses away from the roads, during the last twenty-eight years, it would not, in the year 1900, have been repaid to the nation with compound interest by the saving of hundreds of lives and of millions in means of transport of men, guns, projectiles, and *matériel*?

Although our home training ground is different (as I have pointed out) from the veldt and the mountains of South Africa, still, would not the intelligence of men and horses have been more accustomed to natural conditions; would not their eyesight have been quicker, and would not their familiarity with country surroundings, and with unmacadamised[1] ground have been very different from that of the town-bred, barrack-square, and barrack field-trained lads whom we landed last year in South Africa? Would not the practical exigencies of clothing, equipment, and transport in war, have been better understood and prepared for by practice? And would not living and cooking in the open, in rain, wind and cold, have been encountered with less waste of men and animals? In the rural areas of the United Kingdom (small village enclosures excepted) there are probably at least 1,200,000 miles of fencing surrounding enclosures of one kind or another, whether hedges, ditches, railings, walls, or banks. Agricultural depression has deteriorated the state of repair of these to a degree little realised by those who do not observe such things. Owners and occupiers no longer have spare cash to allow of these being patched in more than a very perfunctory way. Many of them would welcome the compensation, instead of resenting the intrusion.

Again, the conditions of peace service have much to do with a lukewarmness of the professional soldier to the scrambling across an enclosed country, and the consequent wear and tear, the mud and wet, and the deterioration of what goes to make up barrack-yard and high-street smartness. The personal efficiency of an officer can be more easily tested by his knowledge of and adherence to regulation. Payment by results, and promotion, *i.e.*, advancement in the Service of officers, is, at least at home in time of peace, the reward, not so much of the efficient field training of his men, for which there is little opportunity, but of intelligence shown in saving and economising in something, or in being able to express himself eloquently on theoretical propositions which are probably impracticable in war.

[1] The macadamised surface of these kingdoms in the rural areas is about $\frac{1}{250}$th of the whole.

Problems.

May I turn to another side of my subject, and in a few words attempt to lay before you one or two of the teachings which it appears to me we may find in the experience of the century which has just closed. A study of its warfare must bring something home even to the meanest intelligence, which will lead to the impression that great changes have been gradually effected in the conditions. The extent and nature of these changes have been the subject of gradual development, so gradual that it is a question of great interest to the observer how far modern Army Administrations have kept pace with them.

One object of these remarks is to turn the thoughts of the reader to those changes of the conditions of warfare which have been brought about by the use of smokeless powder and by the increase in the range, quantity, and intensity of missiles or projectiles. The writer believes that the effect of these changes or developments is far greater than the conservative student of war is at present ready to admit. Moreover, he believes it can be shown that seventeenth and eighteenth century organisation, training, and comprehension of what are understood as the "arms" of the Service which has governed most of the alterations and been the foundation of most of the improvements in the art of warfare during the nineteenth century are no longer sound. He also believes that the organisation and tactics, built up on conditions a century old, will break down when put to a real test, and that the training founded on them is obsolete.

Except to remind my audience, it would be needless to remark that the fundamental object of warfare, no matter what the scale on which it is conducted, namely, to strike and disable the enemy, has held, and will always hold, good, and that the best leader is he who knows how to organise and use an army with the greatest disadvantage to his opponent and with the least to himself.

Of the blow, or battle, in which one army disables another, history gives innumerable examples, but we need not go behind the last century for them. Long study of these, and of what happened before and after them, is necessary to realise their import and teaching.[1] As in the "ring," they have sometimes begun as mere feints; at other times each side has intended to fight it out; but whether the arena has been the Peninsula, the Crimea, France, Germany, Italy, Russia, Turkey, or even the Transvaal, the strategy and tactics have all had the object of disabling the opponent by one or more blows, and thus to cause him to yield.

History shows how avoidance of the blow, or attempts to neutralise it with the object of delaying its effects, or the attempt to make war less disagreeable, have been oftener consequent on political considerations

[1] The Army was told lately at Aldershot that the best way to get a taste for the scientific study of the art of war is to begin with reading fiction containing military narrative. The same kind of reading is guilty of the popular idea that artists' pictures of battles are like the reality.

than on the true issue which should lead, as quickly as possible, to a situation in which one side or the other must give in.

The immediate question is, how far the means of administering the blow, and the manner of dealing it or of giving a counter-blow, remain the same as they were at the beginning of the century. Has the ballistic effect of the appliances remained the same? Or, has the *main-d'œuvre* altered? Or have the conditions under which it can use the appliances or weapons been changed?

Any small change in the vital energy and intelligence of the man and of the horse may be left out of consideration. There is little, besides the existence of railways, in the features of the surface of a country, whether natural or artificial, which has altered. But when we come to the appliances for disabling an enemy's *personnel* and *matérial*, we find that these have advanced in their development, and in extent, in a degree fully equal to the march of science and intellect. How far the intelligence of the soldier and of his leader has also advanced, so that all that science offers him is utilised to its fullest extent, is an object worthy of the investigation of any thinker. In considering the subject, it is as well more particularly to emphasise that there is no mystery in what is known as "drill," or, in the objects in view, by those who teach it, or in the training men to move in combination without confusion, or to manœuvre. The ordinary professional soldier is apt to allow the lay mind to imagine there is something lying behind what is called "soldiering," which he cannot understand. Is not the expression "There is nothing like leather" of military origin? The only thing that it is difficult for the lay mind to grasp is, the effects of military training in time of peace on the results expected from an army in time of war. Many soldiers even do not grasp it.

In the beginning of the century the man, whether horse or foot, who directed a projectile from his shoulder was one whose chief mission was to get at his opponent with a bayonet, and very often he succeeded while strictly adhering to the drill which he had been taught. Many tacticians of that period rightly believed that the projectile part of his work was secondary to the combat with the *arme blanche*.[1]

The Soldier on Horseback.

From the earliest times the cavalry soldier was essentially a man who fought and disabled his enemy while sitting on the back of a horse, or else he delivered a physical blow in a combined charge, when man and horse struck against man and horse. The horseman in war was probably at his zenith as the most powerful arm of the military services, when,

[1] An old soldier of the 86th in the Indian Mutiny naively expressed this to a comrade, when the regiment was being re-armed with rifles, to replace "Brown Bess," and they were being taught musketry during the intervals of fighting. "Mushketry, bedad! what's the use of mushketry? The 86th boys niver pulls the trigger till they git the bay-net into thim pandies, and sure thin they ca-n't miss."

between the fourth and seventh centuries, the horse-bowmen were more numerous in battle than any other "arm," and when their numbers most frequently decided the day. Later on it became necessary to clothe the horse with armour like his rider. As time went on, the value of the horse was more prominent as a means of giving mobility to the musketeer and to the scout. The great Napoleon's tactics temporarily rescued cavalry from the subordinate position to which those of the eighteenth century had relegated it. As the range and precision of projectiles have increased, the *rôle* of the man who fights sitting on the horse has again narrowed. When cavalry is used as "mounted infantry" the whole theory of his existence as a separate "arm" disappears, and his training, organisation, and "oneness" with his horse, is less appropriate. Can it be said that the cavalry of European Armies is not far more a peace organisation for purposes of military pageant and spectacle, or for police duties, than for war? I have heard it said that a German officer who accompanied our forces in South Africa spoke most disparagingly of our cavalry. I have heard the same from our own officers.[1]

South Africa, with its absence of enclosures, is the ideal area of warfare for the mounted soldier, as the United Kingdom, on account of the density of its intersection by fences, is the reverse.

Whatever the mounted soldier may be called in the future, the title "cavalry" will be likely to tie him down to the traditions of the nineteenth century. These traditions prescribe the sub-divisions, heavy and light. For the *raison d'être* of the heavies we have the example of the charge of the Heavy Brigade at Waterloo, of the French cuirassiers at Wörth, and of the Germans on the 16th August, 1870. Is there a cavalry officer who has been under modern rifle fire who thinks these can be repeated?[2] With all the experience we have had, we send dragoons out to live on the veldt with lance, sword, pistol, and carbine, riding 20 stone, on a horse which, it is true, can carry the weight on parade, when well fed, groomed, and when he stands in his stall twenty hours out of the twenty-four. Ask the same unfortunate animal to live and work under the conditions of warfare in South Africa, that ideal country for the mounted soldier, and no wonder our foreign critic goes away with a self-satisfied air as to our inferiority.

It is certain that the Armies of the twentieth century will have men mounted on horses who carry a long rifle. All the useful conditions of so-called cavalry life in time of peace may be grafted on to

[1] Some letters I wrote to the *Times* in the winter of 1899-90 over the signature of "Swastica" referred to this question, and, I think, showed that man and horse, after a year in South Africa, may become on active service as serviceable cavalry (using the term as it is popularly understood), under the faulty conditions of their equipment and mounting, as can be found in any Army.

[2] In the Mutiny, during the pursuit of the Gwalior contingent, after the action at Calpee, I witnessed a charge in the open maidan on a large group of kneeling and standing infantry, firing from muzzle-loaders with bayonets fixed, by a squadron of that (then) splendid regiment the 14th Light Dragoons. When the charge had passed on, there were a few dragoons on the ground, but not one foot-soldier had been touched.

a squadron organisation of such units, but the man himself must be[1] what Lord Dundonald described, shortly after his return from South Africa, a soldier, who should be :—

1. A first-class rifle shot.
2. A good walker.
3. Able to stick on his horse.

If to this may be added that he must be clothed and equipped so that he has not first to think (to the detriment of training in time of peace that is worth the name) of spoiling the "spit and polish"; that he must thoroughly understand his horse, and how to feed, water, picket, and ride him, so as to utilise the animal's energy to the highest degree; that his present riding-school teaching is only effective in exhausting the physical energies of himself and his horse, and plays up to the imagination of our military artists, then the practical "soldier on horseback" is correctly described.

There are other conditions of weight, equitation, and shoeing, which no doubt Lord Dundonald had in his mind; but all that need be remarked is, that the unit thus described is diametrically the opposite in most respects to the cavalryman of European Armies.[2]

Projectiles from Vehicles.

Let us come now to the artillery. Here again, at first in the history of its use, there was an interchange of projectiles, only at a greater distance than between muskets. The men who used the gun mounted on wheels, were, for instance, in India, in John Company's days, personally armed only with a sword. If armed with a short-range carbine it was rarely, if ever, used except when fighting in entrenchments, and then only

[1] There is a military correspondent of the *Times* (I wish I knew his qualifications), from whom an essay appeared on "Mounted Infantry" in the issue of 11th January.

According to his lights, wedded to the organisation of the nineteenth century, he ventured to write about the mounted rifleman as another "arm of the Service." A great many of his remarks were excellent, but he utterly misled his readers, who have not thought that the distinction of being carried instead of walking, is no true or scientific division of the men who fire from the shoulder.

[2] A question to be asked is: Have those whose duty it is to advise nations read the century's lessons in war aright? For instance, have they admitted that that part of the art of war which employs the cavalry of European Armies for scouting or charging in an enclosed country has almost disappeared, and that it has gradually become unpractical to regard it as an "arm" of the Service? Is the *métier* of a man whose business as a scout is to use his eyes and brains (not to kill, unless attacked), whether he is mounted on a horse, or a mule, or a bicycle, or an automobile (if we read Lord Dundonald aright), fulfilled by the cavalry soldier, either individually, or organised and equipped as he is understood by the European War Offices. There is no use saying that Continental Armies still use the cavalry they now have in their manœuvres and scout and charge and form a screen with it, and call it an "arm." The arguments as to the cavalry, *quâ* the cavalry, of the nineteenth century being an obsolete "arm," cannot, I submit, be answered, and the sooner we make up our minds to sift the question without prejudice to the very bottom the better.

in the last resort. The artilleryman's orthodox means of saving his gun and himself from capture was to limber up and be off. Governing his classification as horse and foot artillery was a condition which was as much decided by the limits of mobility of the man on foot or of the man on horseback as by the weight of the projectile. Between the Peninsular and Crimean wars the scientific study of artillery tactics had almost disappeared.[1] The infantry general regarded the artillery officer as a specialist.

The lessons to be learnt from the American war in the sixties were obscured by special conditions, chiefly due to the growing inequality between the North and South, both as regards war material and supplies. In the Austro-Prussian War, the lessons of the effects of the use of the breech-loader on one side only were limited. The effects of large projectiles within the fire zone were most evident by the cutting down by shot and shell of half the young trees in the wood between Chlum and the Bistritz. In the Franco-German War, leaders were learning that there *might* be zones of fire in the open which no troops could cross without being almost annihilated. In Turkey, the Russians, on account of the high trajectory of rifle fire, were able to traverse ground, which, with the present trajectory, it would be folly to attempt.

The examples afforded by the wars of the century are of ever-varying degree and innumerable. But one thing is clear, that the width of the zone for projectiles of all sorts, the density in the air of the missiles, the facilities for "searching the ground" whether with weapons which are used from the shoulder or from the vehicle, has been multiplied (assuming the old range of the musket as 100 and of the gun as 1,000 yards) by between ten and fifteen. Besides, there is the factor of difficulty through the use of smokeless powder in locating the points whence fire emanates. The eye no longer helps. The ear alone remains to guide the combatant, and even this aid might disappear if the discharge of a projectile could be effected without noise.

What does all this mean in war, and what effect will it have on the mind of the practical student who searches deeply after cause and effect, and who feels that the safety of nations depends on the conclusions come to and on these conclusions being acted on? May he not with advantage, as a preliminary, study what (for instance) would have occurred in Belgium when Napoleon and Wellington faced one another in 1815 if their forces had been armed with the weapons of the present day?

[1] As an example of how little the use of artillery was understood by the leader of that time, it is interesting to remember that at Boomplatz, in the fifties, the opening attack on the Boers was by rifle fire at a range of about 300 yards which was a distance which the riflemen could just cover at the double when their blood was up. The mounted Boer rifleman had a muzzle-loading weapon, and, although his aim was good, the discipline of the British infantry, the short distance to be covered by the man running on foot with a bayonet on his weapon, the narrow zone of fire and its thinness (so to speak) obliged the more mobile force of Boers to fly. The projectiles of Sir Harry Smith's two field guns hit no one.

May he not reasonably speculate on the results of the invasion of Bohemia in 1866, if at Königrätz Edersheim's cavalry had been mounted riflemen handled by a Stuart of Confederate fame, and if 2,000 engineers had during the previous night fortified the Tummel-platz? May he not ask himself, if the flank march against the French right on the 18th August, 1870, could have succeeded the same evening, and if it had not, could the Germans have maintained another day's fight, as well as their line of communications? But it will be said that these questions are problematical. The answer is that all deep study of war presents problems which cannot be logically solved, but which in the light of the advance of science will teach grave lessons to those who make them the subject of exact (or scientific) study.

The "Arms" of the Service.

Now as to these so-called "arms," which propel projectiles, are they —the so-called, artillery and infantry—not, unquestionably, one "arm"? The leader who first appreciates this, so I contend, will win. It is likely that we shall not cease, in our lifetime, to call the one an artilleryman and the other an infantryman; but as range and rapidity and accuracy of fire are all a question of degree, must we not be prepared to organise and train the forces which use projectiles to disable the enemy, as one "arm"?

An alliance between firing from the shoulder and from wheels, as regards equipment, has been already effected with the Maxim gun—both as regards enlistment, organisation, and training. The old empirical separation of "arms" having the same object must disappear.

The fact of having to ride, or drive, or care for a horse, is no sound distinction between the (so-called) artillery and infantry soldier. The intelligence of the men we enlist, as it grows with the spread of education, as to understanding the simple mechanism of the rifle which he carries or of the small and large rifle on wheels which we call a gun, and their working, cannot be classified by the grant of a penny a day in pay, more or less, or, by the difference in cost of a yard of red or blue cloth.

The real scientific division is between the man who has the qualifications to allow of his being trained to shoot accurately from the shoulder, and the man who does not possess them. Every man who is entrusted with a weapon to shoot with from the shoulder should be a *real* rifleman. All men who cannot so qualify should be artillerymen, or if associated in a battalion with riflemen, should be Maxim men, or machine-gun men. It does not matter what is the graduation in range, etc., it must be recognised that a projectile weapon, whether carried on a man's shoulder, or carried on wheels, and pulled into action by men or animals or traction engines, is a weapon having one object, and that all tactics must be governed by the effecting of that object. The recognition of a graduation in the shooting efficiency of the rifleman who is distinguished between the "marksman" and the inferior shot already exists. Just as with the weapon on wheels, there is a material graduation, as in the Colt gun, Maxim gun, so-called "pom-pom," field artillery light and

heavy, guns of position, and so on. It is a well-known fact that a man with all the qualifications for becoming an efficient rifle shot may never be able to lay a gun, and *vice versâ*. The ballistic effect of the projectiles, will be in proportion to the efficiency of the weapon, and of those who use it; and to their organisation as bodies more or less mobile, all having the same object in view.

Now, as to the influence of the factors of this ballistic effect on tactics.

The misuse of the expression "frontal attack" (chiefly by war correspondents) leads to misunderstanding. In one sense, there is no such distinction, every attack is frontal. If it is not in the nature of a surprise to the attacked the effect varies according to circumstances. One thing is certain, namely, that an attack, unless the attacked is unprepared, is now as sure of failure as would have been Alva's if he had marched his army straight across the glacis and up to the ramparts of Bois-le-Duc, expecting to take the place. The sapper and artilleryman ask, But what about "preparation"? The answer is: Admitted, "preparation" *may* pave the way for a frontal attack, just as in a regular siege it prepares for the assault of a breach; but the question follows: When the objective is, say, 2,000 yards off, and the intervening space cannot be reconnoitred or there is not time to sap across it, when a deadly zone of projectiles skimming the surface intervenes, what experience, what estimate of the *élan* of men striving to get within bayonet touch of a defender, justify the attempt, even if the chances of success were tenfold greater than they are? So-called preparation by a rain of missiles of all sorts and sizes and at various ranges, will soon be found out by a thoughtful defender and he will reserve his own ammunition to destroy the personal attack.

After the Crimean War the military engineers Burgoyne, Todleben, and Brialmont saw the dawn of great changes and hastened to adapt the more exact science of fortification to meet its exigencies. Their minds were fifty years in advance of their time, but still the writer well remembers that the general balance of opinion in the sixties was that "the attack had gained."

Let me particularise a little.

I claim that the word "*cavalry*" is obsolete as descriptive of an "arm of the Service." Its usefulness as a title could only be justified by its antiquity, and it cannot compete with that of "*mounted rifleman*."[1]

The word "*infantry*," in its strict sense, means a foot soldier, no matter what may be his *métier*. It should not be confined to the units of a so-called infantry battalion.

The word "*artillery*" is a misleading expression, unless it embraces generally all means of discharging projectiles. In such a sense the word

[1] As George Chesney pointed out 25 years ago, the skilled rifle marksman, trained to ride and care for his horse, is the essence of military efficiency concentrated in one unit. The writer has a vivid recollection, when the audience separated after that lecture, of the commiseration expressed by well-known military experts for Chesney's presumption in trespassing into a field of which he was supposed, as an engineer, to have no knowledge.

"*gunner*" is equally applicable to the present infantryman and artilleryman.

Assuming that any combatant organisation which is not suitable to the act of war, *i.e.*, the time of battle, either on a small or large scale, is wasteful and therefore unscientific; then, it is wasteful of energy, physical and mechanical, to place a rifle for use in the hands of men who cannot be taught to use it with fair skill, say, up to 1,000 yards; that is about 50 per cent. of the men who are enlisted into the Line. It is wasteful in action to use that man-energy to carry excavating implements, to dig trenches, or build cover (beyond what he can do with his hands). It is wasteful of the energy of that 50 per cent. who should be serving weapons on wheels to require them to carry a rifle or ammunition on the person. Projectiles discharged from the shoulder by men who are not marksmen are wasted. It is wasteful of the energy of the man—"the engineer soldier"—who has to use explosives, to dig trenches, or build cover in action, to require him to cripple his limbs with the rifle and ammunition of the rifleman, the use of which will divide his attention from concentration on those duties which are his special *métier*.

These remarks are supported by the practice in the past, with the men (*i.e.*, the artillery) who serve weapons on wheels which have horses or other means of traction. The field gunner of the present has his carbine carried for him in battle, and in European warfare he is rarely ordered to carry excavating implements, or exhaust himself with digging trenches. It is illogical to say that every man should carry a weapon with which he can shoot from the shoulder, in order to "give him confidence." Enough confidence would be given by the possession of a bayonet-sword stuck on a long revolver.

If confidence is only acquired by having the use of a weapon of similar range and effect as that of your opponent who is firing at you, where would be the confidence of the infantry soldier under artillery fire, or of the artilleryman under infantry fire? The confidence of the soldier is derived from other conditions than those subject to the size and range of the projectile that is directed against him. Scientific tactical training means teaching individuals and small units how to act under the fire of all sorts of projectiles. Confidence logic has piled on to the back of the modern cavalry horse a lance, a sword, and a carbine, so that the rider may think he is ready to meet any contingency.

No practical example will suit the frame of mind of objectors who have, what may be called, "attack on the brain," and who, amongst other things, have never taught their men that to retire skilfully is as important as to attack intelligently.

The leader, as I have already said, who attacks, *i.e.*, moves to the attack, with men (not clothed in impenetrable steel) across country resembling a glacis is—well—it is not hard to give it a word. Should it not be elementary knowledge that his justification will depend on the frequency of what may be called "the stepping-stones" and the existence of irremovable impedimenta between him and his objective? These "stepping-stones" will be either natural or artificial cover, or the same artificially improved as cover during the advance.

During that time, each unit according to his *métier*, should be devoting all his energies to one object, not to several objects, namely:—

a. The long-range wheel gunners (or artillery) to disabling the weapons on wheels of the defence.

b. The most skilled of the shoulder-gun men (or marksmen), to scouting, thus drawing and keeping down the fire of the opponent scouts, and indicating the positions of the intervening "stepping-stones."

c. The engineers should immediately follow them in *very* open order, excavating or improving cover at the "stepping-stones" or points so indicated by the scouts. The commander would concentrate all his available engineers on this part of his battle-field, so as to have at least as many of them as of other infantry.

d. As the cover was made it should be occupied by the rest of the riflemen, who would continue to advance from cover to cover, and to reinforce the scouting line.

e. As the riflemen advance, their places would be taken by the light guns on wheels (such as Maxims), the machines to be dragged by men, or, if necessary, to be carried in pieces and put together under cover. These, particularly if they were used with shields, should be able to get within about 800 yards of the objective.

f. Within that 800 yards of the objective the possibility of further approach would entirely depend on the density, ballistic effect, and nature, of the fire of the defence, and on the natural and artificial features intervening, the advantageous use of which, by the attack, the defenders had not had time to neutralise.[1]

The same procedure would have to continue until the distance allowed of a final rush. It seems to me that once such a closing on the defenders were possible, it would matter little whether a man used a clubbed rifle, or a bayonet, or a pick, or a shovel[2] with which to strike the defenders.

A careful study, for instance, of the tactical action of the three arms at the battle of Borodino will, I think, show how entirely the conditions of the incidents of a battle have changed, and how the conditions which gave rise to the resemblance between the battle at close quarters possible then and a pugilistic encounter, have disappeared.

The view of the question which the writer suggests points to a great change in the organisation of units, and their tactical training

[1] On p. 473, July, 1900, of the *Household Brigade Magazine*, Dr. Maguire quotes Generals Ferron, Rhone, and Skugarevsky as to the probable losses to be expected in the last advance towards the objective. With 100 men defending, the loss of the attackers starting with 637 would be 537 men while crossing the zone of fire between 800 and 50 yards.

[2] There is no reason why the engineers' pick or shovel should not be capable of having the sword-bayonet fixed to it, when it would be as formidable a weapon as the *arme blanche* of the rifleman.

in combination, which is emphasised by the ever-increasing dispersion of men and guns under fire, and the effect it has on command and direction. Already the shadow of these changes is seen in the allotment of Maxims to infantry battalions. Must not that change be extended and half the men in the battalion carry rifles which require marksmen to use them, and the other half be attendant on Maxims? What weapons on the person the Maxim-men or the men who serve rifles on vehicles should themselves carry remains to be considered. Sound truths, and not prejudice or tradition, must guide that consideration; at any rate, they will not require long range portable fire-arms. The ballistic effect and accuracy of the fire of a company of infantry would thus be multiplied by, at least, as 5 to 1. Half the company being lightly armed can carry more ammunition. The means of bringing ammunition up to the firing line requires re-modelling. Bicycle builders can now make vehicles with low wheels for man traction which will carry thrice the load for the same weight. One-eighth of a battalion may with advantage be devoted to this duty.

Lately, that "the defence has gained enormously" is on the lips of soldiers. The speaker believes that the balance remains as it ever was, and that the success of scientific attack against scientific defence and *vice versâ* will depend on the intelligent use of up-to-date means, and as ever on the *esprit* and the training of the soldier. But if either the one or the other is unscientific, all the *esprit* and training will not prevail.[1]

As it has ever been, the tactician will try to "turn" what he cannot attack. Moving on interior lines (unless the two forces find themselves moving on parallel lines as Soult and Wellington once did) the defence *must* for a time have an advantage, which is reduced only by disproportion in numbers when the attacker's objective is the defender's base or some great metropolis.[2]

[1] He does not believe that the training should be to make use of *esprit* in a way destructive to confidence in the science of the leader.

[2] Even if the British riflemen outside Ladysmith had been mounted and their mobility been equal to that of the Boers, the political condition, by which the holding of that town became a necessity, would have still neutralised the British advantage after the disparity in numbers between the contending forces outside Ladysmith had disappeared.

In several respects the series of apparent mistakes by both the contending parties in Natal are instructive, and might be brought home to the minds of an interested public. Whatever may have been the faults of the initiative on either side, they are clearly local and personal, and it is a vast pity that the British people had been led by thoughtless Army reformers to attribute them to conditions which can be altered wholesale, and which are not present in the peace administration of any Army in Europe. Although most of the conditions in South Africa were widely different from those in European warfare, the lessons bearing on the subject under consideration, namely, attack of positions defended with modern weapons cannot be too carefully studied. Only now have the detailed official reports of the attacks on the Boers outside Ladysmith been published. The popular story-book narratives that have been printed are not written in such a way as to enable the military student to arrive at anything but approximate conclusions. The despatches are not more helpful to him.

The writer of articles in the *Times* on the last French Manœuvres fairly exposed the unsoundness of the tactical theories upon which their movements for attack were based. Given a position, covering a place which is the objective of, say, an invading army, it is certain that its capture by direct or by flank attack, when the defending force can change its front more rapidly than the assailant, is impossible except by sap. The defender of a position chosen by himself should be able to make absolutely sure of preventing an assault getting within, say, 800 yards of him. The invader's strength will then lie, in threatening the objective along another line of advance, in his advantage in having the initiative, and to that extent in the choice of ground. If his choice in these respects is sound, the accidents of the surface of the country will give immediate strategical and tactical advantages, will neutralise the power of the defence, and so on, but the fire zone of the defender will always oblige him to move along exterior lines, the length of which may be beyond the day's marching powers of his force. Mobility of those who use projectile weapons is therefore more essential than ever for attack. It must be possible to move over at least *twice* the distance in the 24 hours than can be done on foot by the defenders. Thus we can understand the value of the horse bowman of the early Middle Ages, and we come back to the need of mobility for attack of the forces which kill with missiles, and can realise the uselessness of the "arm" the chief *métier* of which is to strike from the back of a horse. However much we may have been struck by the advantages of the mobility of the Boer rifleman in defence (4 to 1 as against the British rifleman on foot), the lesson was incomplete because he rarely took advantage of his mobility for actual attack, as he might have done. In Natal we had a striking example of a mobile force acting on interior lines against a slowly moving force acting on external lines.

Tactics in principle will be always unaltered, but their practice as a guide to organisation must be fundamentally revised. The sooner the better for the safety of this Empire.

The chessboard control by the Commander-in-Chief over a battle has disappeared. For instance, the battle of Waterloo was fought within an area of $3 \times 3 = 9$ square miles. It would now occupy an area of $9 \times 9 = 81$ square miles. With this change the story-book and illustrated journal descriptions of battle have no reality. The old conditions (let us imagine), it is true, could be restored by depriving both sides of their ammunition. Can any of my hearers realise that we shall never again hear of the commander, from his point of vantage, guiding the artillery preparation, the infantry attack, and the cavalry dash at the shattered battalions or disabled guns?

The future proportion and varieties of size in the rifles carried on wheels (or guns), is the next question of vital importance, and its study must be stripped of all the empirics which have grown out of the old-fashioned classification. The experience taught by peace manœuvres here and on the Continent is rapidly becoming obsolete. Smokeless powder is an active cause. The well-directed hail of projectiles cannot be too heavy, or too dense, or too searching, or too wide in its range, if it

has to stop an attack, or if it has to destroy a defence. Its moral effect when used as a deterrent *only*, has been grossly exaggerated. Only dim glimpses, discerned by few, were given by the Transvaal War of what the projectile duel of the future will be like. The would-be Army reformers have only scratched the surface of the question, and if they are listened to, we shall be only where we were.

The Engineering Arm.

The attention and energy of those who kill with projectiles, whether with a weapon held to the shoulder or carried on wheels, must not be diverted in battle from their one all-important work to do other work for which the engineering arm is designed. The heavier the weights that have to be dragged into action over ground which is found in Europe, the more (what may be called) scientific means must be in the fighting line. The provision and working of these is clearly the work of the "engineering arm," not of the arm which uses the weapon. Whether prejudice or parsimony is the motive, the opposition which they create to the obvious steady increase of the active sphere of the "arm" which *uses all the other forces of nature to disable or help to disable an enemy*, must fall before the common sense of the world. The work in our small wars, in our peace manœuvres, and even the work done by Jack on shore, all tends to obscure the importance of this proposition.

If those who oppose these views do so on the ground that mobility is the true indication of the dividing line between the so-called "arms," as regards "cavalry" and "infantry," and that weight of *matériel* is the guiding factor that distinguishes between those two so-called "arms" and "artillery," and that every fighting unit should also be equipped and trained as a military engineer, and such it is conceived would be their contention, then there is a fair field for discussion, and all the speaker wishes at present to urge on his hearers is, that he has put a case before them which is eminently ripe and fit for discussion.

If these views are sound, then all the organisation and tactics of modern arms, based on the practice of one hundred years ago, is hopelessly behindhand.

Obstruction.

The great "save-trouble" kind of administration of Armies in time of peace too often takes refuge behind specious claims on behalf of something which is not, but which it calls *esprit de corps*. The same vicious spirit panders to those with whom economy is the first object, and who are very powerful. Half the Army reformers do not know what they want. The other half do not know how to get at what they want. Herein lies the strength of the position of the "how-not-to-do-its," who do not want real Army reform. Their task is comparatively easy, because of the difficulty the man in the street has in appreciating the true meaning of the term "ordinary business principles," as applied to a military administration in time of peace. His difficulty, and the opportunity for mysti-

fying him, lies in the appreciation of the exceptional conditions of the case. As I have already remarked, the exceptional nature of the condition in an Army administration is, that while it ought always to be improving it is preparing for something, namely, warfare, which, while being the single object of its existence, yet only occasionally arises, and which, while it should always be anticipated as if it was near at hand, often appears from a direction and in a way quite different from reasonable expectation.[1]

An Advisory Board.

I may be asked, Where is Army Reform to begin? I was much struck by some words in a letter which appeared in the *Times* on Christmas Day, signed "Sick List." "The great and all-important reform required" (he wrote) "lies outside and not inside the Army. . . There can be no real efficiency" (he added) "until the national spirit is awakened." In other words, until the nation tells Parliament that it must have real efficiency in return for what it pays, until Parliament realises that no professional responsibility is at present possible, and that it cannot be had until an independent board or body to advise them is created, then only can the nation be sure of knowing what is wanted.

I would ask, Where does there exist in our Constitution any individual or body charged with responsibility to the nation to advise authoritatively, apart from all questions of party politics, and finance, as to the military (Army and Navy) requirements of the Empire?

Can a War Office, ruled by a party Minister, be independent of party politics or considerations, and can the whole truth ever reach the ears of Parliament and of the country through him?

Can a so-called Defence Committee composed of civilians, whose minds have never been trained to war, and who exist only by the support of a Parliamentary majority be trusted for one moment as competent advisers?

In a country like Germany, where there is a "General Staff," those who compose that body are in a situation quite different from anything that now exists in this Empire. In the first place, their Chief is the Sovereign, whose headship of the Army is real and carries with it a responsibility to the Fatherland. Nothing resembling the conditions of their responsibility to the Sovereign exists here. In the second place, their task is smaller and less complicated than it would be if they were dealing with the widely-varying circumstances of the British Empire. In the third place, in countries where there is compulsory service, their responsibility is also, through the military hierarchy, to every individual who serves. This

[1] In spite of the so-called "Army reformer," the writer has absolute faith in the doctrine, or whatever it may be called, namely, that it is only by all that is embraced in the expression *esprit de corps*, an Army can be held together ready in time of peace for real warfare; but he sees too much in principle sacrificed in time of peace to a civilian conception of what *esprit de corps* means, and, also, too much of the results in action to be expected from *esprit de corps* of the conditions based on old experience, which lessons the century has reversed.

creates a direct responsibility to the National Army, which is the strongest visible power in the State.

Months ago, I advocated the creation of an advisory body, as permanent, and as independent as the Judicial Bench.

a. It must be absolutely independent of Parliamentary parties, and of administrative departments.

b. Its composition must be of persons in whom the nation has entire confidence.

c. It must have nothing to do with administrative or executive (War Office and Admiralty) duties. As soldiers and sailors its members would have risen in the Service to positions in which they would have gained the confidence of the nation, and would have become acquainted with the working machinery of the naval and military administrations.

d. The appointments should be by the Crown, subject to confirmation by Parliament, and *quam diu se bene gesserit.*

The chief duties of its members should be :—

e. To gather into their hands and bring within their ken by means of an intelligence bureau all the strings of information as regards our Navy and Army and all the forces for defence of every part of the Empire, whether existent or possible, and similarly, of the forces of other countries.

f. To study all the conditions of defence and all the possibilities of warfare, within and around the Empire.

g. To live, as it were, always as if war was imminent, and always just beyond the political horizon, and as if the consideration and preparation for it were vital to the existence of the Empire. In this latter respect, having no responsibility for executive or administrative duties, their minds would not be subject to the paralysing effects of military administration in time of peace.

The responsibility for its recommendations must be to Parliament and not to the Cabinet that may be in office for the time being.[1]

Their channel of communication with Parliament must be directly through Parliamentary representatives, so that if desirable, matters necessarily confidential (these would really be very few) may be confided to a small number of persons.

For this purpose a standing Joint Committee of both Houses should be appointed, in which both parties would be represented, through whom

[1] "This is the point (the means of defence) at which every Cabinet of our time has failed of its duty. There may have been Governments that have considered the subject of defence ; there has been none which has inspired the nation with a reasonable confidence in the success of its endeavours."—Spencer Wilkinson in "The Nation's Awakening."

Sir Frederick Maurice in his "National Defence" states :—"But it (the Government) cannot and will not act because of our party system, until the public at large, the body of the voting electorate, realises what the danger is. This then is the danger, that whilst the only men who know what the real needs of the country are cannot act, the public who determines everything does not know."

all communications from this constituted body of Military Advisers, or Military Board, should pass (I use "military" in the general sense).

It would be preferable, of course, if the spokesman of the Board could appear before Parliament and make his own statements. The possibility of this is a Constitutional question. The members (say three) of this Board must be as independent of the Government of the day as the Bench. I suggest three because the relative range of subjects and their difficulties, as between Army and Navy, is as 2 to 1; therefore, there would be two soldiers and one sailor. My reasons for this proportion are, that naval preparation and administration are much more easily understood and maintained in a state of readiness than those for land warfare.

For example, as the scene of operations of naval warfare is on the sea, and as the combatant units are ships, the practice in times of peace resembles that in time of war much more nearly than is the case with the land forces. It does not require the professional mind to understand how imitation warfare is much less real on land than on the sea, and, consequently, though each requires careful study in time of peace, that study has to deal with much more intricate questions when probable war on land is being considered.

These proposals seem very drastic, but I have never yet been able to hear of any other which will fully meet our case. The Admiralty and the War Office would continue their executive functions and carry out the policy which Parliament, acting on the advice of this independent Board, will have then to define. A large saving in expenditure would soon follow, because numberless economies which might now be effected but for vested interests would at once be tackled, and, if any interest felt itself unfairly treated, it would have an appeal to the highest authority, advised by a body which would only have the safety of the Empire to consider. For example, the enormous retired list would be gradually reduced, because the first policy of this Board would be, to recommend the reduction of the professional military element[1] to an essential minimum, *i.e.*, the numbers of those in the public service who engage to give their whole time to military life; and gradually substitute for the great Civil Service which permanently holds office and runs the Admiralty and War Office, naval and military men who have served professionally and with distinction in the active permanent lists, in all grades and ranks.[2] This policy would be rapidly appreciated by the

[1] When I wrote this I had not read "The Great Boer War" by Dr. Conan Doyle (see p. 531 of that work), where he proposes "to decrease the number of the professional soldiers."

[2] Much that has been massacred in late years of the military prestige and tradition of the Army, upon which an Army lives more than on pay and rations, would be restored. To a Board, such as I describe, could be imputed no insincere motives when its measures tended to encourage the true military sentiment, instead of injuring it by what I have already referred to as the demands of the so-called business man. For example, the misapplication of military titles to special occupations, which, however essential to the existence of an army in the field, have no function to perform in disabling the enemy, would soon disappear. The vice of over-regulating and of sealing patterns in excess, inherent to an active peace administration of soldiers by civilians, would be checked and money saved.

Colonies, because they would have the best authority which the country could produce responsible for the military recommendations. The Colonies and dependencies would then better realise their obligation to help in maintaining the means for military offence both by sea and land. As I have described, so I submit, the experience of the late century points out how "Army reform" should be begun. Not, by "sweeping out the Augean stable" (a favourite expression) of our public offices, which any thoughtful man will realise must do as they always have done under the conditions of civil control, guidance, and organisation, subject to party exigencies, but, by telling the nation honestly what is required.

Offensive Defence.

The history of the century indicates in every way that there is a latent national spirit, which has only to be roused to show that *if* the Regular Army were to be employed entirely outside these islands, the defence of the soil, *if organised and trained in time of peace*, may be left entirely to the manhood of the nation, a million of whom would form a Territorial Army under the guidance and control of the men who have passed out of the ranks of the Regular or Professional Army into the Reserves.

When Lord Salisbury, on 9th May, 1900, told the Primrose League at the Albert Hall that "what we have to look to, what we have to determine, is, how is the manhood of this country to be utilised for the preservation of the Empire," he probably had in his mind the words attributed to Nelson: "England expects every man to do his duty," or, as the *Times* put it on 17th May, 1803: "We shall fight . . . . for our laws, for our fields, for our existence . . . . *for all*, and it is not to be doubted *with all*."

These after all are empty words, unless the duty of every man is laid down before the emergency arises. It does not matter that Lord Salisbury had the sufficiency of defence by the Navy in his mind, at the same time qualified by the admission that we must have "troops" in sufficient numbers to make the enterprise of any enemy that would attack us absolutely hopeless. His words admit that, while conscription, in the Continental sense, is outside practical discussion, it is feasible that every male shall be so registered in time of peace that his place in the service of the defence of the fatherland is automatically, as it were, defined, and waiting for him to enter into, in the event of his being thrown out of his employment. In other words, that, while all those who bear arms shall do so voluntarily, the service of all those who, either from want of will, want of training, or for other reasons (some physical), are not engaged to fight, and who are thrown out of employment, or, who have no employment, shall be appropriated by the State, at a fixed minimum rate of wage with a free ration.

Only a very few people have, during the nineteenth century, allowed their minds to dwell on the state of things that would exist, not only in these kingdoms, but also in the colonies and dependencies of the Empire, if the so-called "command of the sea" were only temporarily weakened.

The Duke of Wellington never, in his old age even, lost sight of the increased facilities for invasion which were offered by sea transportation with steam-power. Facilities, far beyond his conception, have been continually added since his time. Every other European nation has organised for defence against invasion in a way so that every resource of the fatherland, whether physical or mechanical, is at once available at the call to arms. This Empire, the wealthiest, and in some respects the most practical of all, has no corresponding organisation except on paper.

Organisation of the Nation.

The general proposition which I wish to submit, and for the submission of which I have for some years been waiting until the public mind was ripe for it, may be described in a few words, and I claim that it is the most scientific system of national defence which is suitable to the race.

It is based on the fact that for every one man required to fight, that is to say, to use some weapon for disabling an enemy, two or three men are required to execute the necessary works in a civilised country threatened with invasion, or after invasion takes place, also to help in maintaining order, to keep going all the great national public services from which reserve soldiers have been drafted to the fighting bodies, and to look after the vast population of women and children, who would be unavoidably left in an unprotected condition. Those two or three must be obliged to serve. I doubt if it will be for a moment disputed that a million of volunteer fighters are available. If I am also right in the previous contention, it means there must be two or three millions of workers whose service the State can claim. Whether this is conscription or not, it is different from the drilled and armed population of Continental countries. Clearly, whatever identifying badge these men may carry, they will not be combatants, and they will have to understand that, so long as they do not take up or use arms, they will not be regarded as such. There will be no resemblance between them and the *francs-tireurs* of the war of 1870, who were guerillas. Into the fighting line they must not be sent, and on the approach of an enemy they must be withdrawn, and their unfinished work, if any, must be carried on by the military engineers, who will form part of the combatant million.

At the same time it is evident that any of their work, which, for instance, is applied to the clearing of the population and supplies from an area immediately threatened, or to the preparation of defensive positions, will be carried out well in rear of the line of country or coast in the occupation of combatants. You will see, my contention is, that the application of conscription, as understood on the Continent, is shown by our own nineteenth century lessons, to be unscientific, so far as the Anglo-Saxon race is concerned. By adopting compulsory service for the fighting line, we should lose all the advantages of voluntary service. For

instance (apart from the transportation), could any of the Continental Armies have provided, in 1900, 200,000 voluntary soldiers for South Africa?

Defence Works Corps.

A careful examination of the census returns of 1891 shows that very little assistance is to be obtained from its figures, when it is desired to estimate even approximately the number of males who would be available, on the following assumptions, namely:—

1. That the married men, not already engaged in the fighting military forces, *i.e.*, Regulars, Militia, Volunteers, and Yeomanry, shall, *if thrown out of employment*, remain with their families, and shall at once report themselves to the civil local authority where they are domiciled, for, either, employment *locally* to replace men who have been called out, or, to be enrolled as special constables for the preservation of order.
2. That all unmarried men who have not engaged in the Regular Army, or in the ranks of the Militia, Volunteers, and Yeomanry, shall, *if they are thrown out of employment*, report themselves for Defence employment.
   a. In the case of men who are registered voters, to the District or Urban Council in the Parliamentary division in which they are registered.
   b. In the case of men who have no registered domicile, to the same local authority nearest to their last domicile.

Census Returns.

The absence of distinction in the summary table attached to the General Report (Vol. IV.) between the sexes and ages in the classes and orders of the occupied and unoccupied in the total population (which may now be expected to provide a total of about 19,596,000 males) is fatal to any exact estimate of the number of unmarried and widowed males in the respective classes. The number in each class include both sexes and all ages, so that any attempt even to estimate the number of single men between, say, 20 and 60 years of age in the occupied and unoccupied classes respectively is defeated. Again, in the occupied classes, in which are included professional, commercial, agricultural, industrial, and domestic occupations, there is not the faintest indication in each, which suggests the proportion of women and young persons under 20, to men over 20. What is still worse for our purposes, of the 22,000,000 who come under the head of "children or adults with no specified occupation" there is no analysis whatever.

It is only consistent with the whole of the legislation of the nineteenth century, which has, in its dislike of so-called militarism, deprived itself of even the statistics which would enable the nation to take stock of its strength for purposes of defence.

A very approximate estimate of the single men in the population between 20 and 55 gives 5,277,000, or, say, 4,000,000 when the combatant defence forces are filled up by men between 20 and 40 who are physically fit. If half of these are by degrees thrown out of employment, the 2,000,000 required to execute the necessary works, for defence, and arising out of a state of war, are available. It is certain that the process of diminution of employment would be gradual, and the incidence would vary widely in different localities, also, that the weakest physically and the least desirable morally would be the earliest to come under the obligation to serve. Consideration of this condition shows it to be unavoidable under my scheme, but when constrasted with the entirely opposite conditions in connection with compulsory military service it has this advantage, namely, that those of the community who would become, if the nation was at war, the soonest a source of danger, if only from having nothing to do, would be first brought under control. Of course, this is only a collateral advantage. The scheme is fundamentally the opposite to compulsory military service as it is understood in Continental countries.

Leading and Control.

As to the nature of that control, and as to the work to which these 2,000,000 would be put, those destined to exercise that control require more organisation, ear-marking, and defining, in time of peace, than the mere registration of the individuals. For some time I have been engaged in advocating the development of a system, which is the offspring of a far earlier scheme in the same direction, namely, the Engineer and Railway Volunteer Staff Corps. I do not know that this body of officers, composed of well-known members of the Institution of Civil Engineers, have ever done more than receive commissions, which confer military rank and entitle them to wear His Majesty's uniform. They all have field rank, they have nothing to command, but their names appear in the Army List.

In the census of 1891 we find amongst the professional classes 135,000 persons under the head "others." From these my scheme would enlist 45,000 professional men, drawn from the several engineering societies, from the surveyors, and other professional bodies who are engaged in connection with constructive or outdoor works of one kind or another. Add to these 5,000 from the legal and teaching professions, and we have 50,000 gentlemen who should, if not already on the lists of active combatant units, be engaged in time of peace to come forward to take charge of, superintend, and control, the 2,000,000 workers.

Thus the manhood of the nation in these isles would provide:—

First: The Regular, or Professional, Army (over 20 years of age):—		
a. In India, the Colonies, and Dependencies - - - - - -	90,000	
b. At home, ready to go anywhere, including 20 per cent. Reserves	100,000	
The men under 20 years of age may be estimated at - - - - -	10,000	
		200,000
Second: The Militia, Volunteers, and Yeomanry, for home defence, including their Reserves - - - - - - -		1,000,000
Third: The above-described Defensive Works Corps - - - - - -		2,000,000

These figures are naturally subject to revision, but the scale gives an idea of the scheme.

In any case, the second, *i.e.*, the home defence army of 1,000,000 men must have a military organisation and equipment which will enable 200,000 men to be under arms at a week's notice, and the remainder at intervals within two months.

The third is the Service with which every unmarried male *must* serve if he has not voluntarily engaged in either the first or second. There the compulsion begins and ends.

The registration and organisation of these Defence Works Corps in time of peace will require careful study.

The second and third will be repeated in every colony and dependency of the Empire.

I cannot conclude my remarks with better words than those spoken in this room nearly 17 years ago by the late Sir Charles Nugent, K.C.B., R.E.:—

"When I reflect upon the issues involved, I am lost in amazement at the indifference of the public. To what is this indifference to be attributed? It cannot be to want of information, for this subject (Imperial Defence) has been placed before them over and over again, here and elsewhere, under every aspect; it cannot be to any inherent difficulty in the subject, for it is devoid of professional technicality, and so simple that a child may comprehend it; it cannot be that it is without interest to all, and more to the civil than to the military portion of us."

The Rt. Hon. Sir CHARLES W. DILKE, Bart., M.P.:—The paper which is before us is very largely concerned with a matter into which I do not propose to enter. It is one which, no doubt, will form the staple of any discussion which may take place this afternoon. I refer to the new view which is taken in this paper of the engineering side of the Military Service and the immense development which the author proposes to give to that side. I will point out to those present how very novel are these proposals with regard to the engineering side of the Military Service. The author of the paper has suggested that it is wasteful of the energy of the men to require the engineer who has to dig trenches or build cover in action to cripple himself with the rifle and ammunition of the rifleman. He proposes, therefore, to absolutely extend

and develop that division between the man who carries entrenching tools, for example, and the fighting soldier, which is reproached to us by all foreign observers as one of our defects. In every other Army of the world it has been thought necessary that the fighting man should carry entrenching tools. In our own Army that is the theory, but it has not always been the practice, and the fact that it has failed to be the practice in some cases in South Africa is undoubtedly spoken of by all foreign critics as one of the main causes of the special difficulties which we have met with in that country. The author proposes, as I say, to distinguish absolutely between the engineering side and the fighting side of the Army, although in one foot-note he seems to me to depart from his own principle by suggesting that "There is no reason why the engineers' pick or shovel should not be capable of having the sword-bayonet fixed to it, when it would be as formidable a weapon as the *arme blanche* of the rifleman." I think those are matters about which I am not at present converted by what has fallen from the author, but they are matters, no doubt, on which others will speak. They form the main basis of the paper, and no doubt they will be thoroughly and adequately discussed. The author goes very far in suggesting that the attention and energy of those who kill with projectiles must not be diverted from their important work to do other work for which the engineering arm is destined. He suggests that very many more people are required, in the event, for example, of an invasion, to perform the engineering duties than to perform the duties of fighting in the field. He considers that for every one man required to fight, that is, to use some weapon, two or three men are required to execute the necessary works, and he says that the great majority are to be non-combatants—that on the approach of an enemy they are to be withdrawn. Those are matters which I shall not discuss. I admit frankly that they are the main points in the paper, and I shall leave their discussion to others. I should not have risen to speak this afternoon but for the fact that the paper incidentally contains one or two important suggestions which deal with the whole relation of the Army and Navy to Parliament, and which I think deserve some attention from you, Sir, and from the other Members of the House who are present and who have given some attention to these subjects. There are two other matters in the paper which I may leave to others who are more competent to deal with them, but they ought to be dealt with to-day by someone. The author deals with the question of mounted infantry and cavalry, and one especially of the technical questions which has been most discussed of all those arising out of the present war. He is absolutely against the existence of cavalry as such, and in favour, as I understand, of the conversion of all cavalry into mounted infantry. I should like to say that, as a civilian, I am not converted upon that subject. The author's own statement later on in his paper, that the conditions of South Africa are peculiar conditions, that we must not allow ourselves (as some of us have said in this room before in the discussion which took place with Sir Frederick Maurice in the Chair, when we discussed the Lessons of the War), that we must not run the great risk of allowing ourselves, to argue from the South African case to the case of all future wars. There can be no doubt, I think, that as long as the conditions of Continental warfare are what they are and what they will still continue to be for a very considerable time, at all events, we should be making a mistake if we converted all our cavalry into mounted infantry and ceased to have any troops that could perform cavalry duties as such in the future. But others who are more competent will, no doubt, also discuss that question. The matter which I think we Members of the House of Commons ought to take up is that which we may be more competent than soldiers perhaps to discuss. You, Sir, are both a soldier and sailor and also a Member of the House of Commons, but those of us who are politicians and interested in preparation for war ought to deal with those matters in this paper which concern the very large questions which lie at the base of the whole of the future management of the Army in this country. The author, like most soldiers, and no doubt with good reason, does not think very much of the House of Commons, but I am sure he would wish to be just towards that assembly, and therefore I suggest that his first observation upon the matter is hardly, perhaps, fair. He attacks us with regard to the Manœuvre Bill. He says:

"It is hardly credible, but it is a fact, that it was thrown out in the House of Commons by the Standing Order Committee, on the ground that no notices had been served on owners or maps published of the areas," and he then speaks of the Bill as having been wantonly cast aside by its representatives. You will remember, Sir, what I remember what occurred with regard to that Bill in two successive sessions. The Standing Orders of the House of Commons are not a matter in which we have any power or authority at all. Where Bills touch private lands they are subject to the provisions of the law which are laid down for us and not by us, and no individual Member of the House of Commons has any authority whatever in regard to those questions of law. But with regard to the substantial matter, I am bound to say that the independent members on both sides of the House of Commons did very warmly press the matter on the consideration of the Government, and the Service Members of the House, several of whom I see here to-day, took a most keen interest in pressing that Bill on the Government; and certainly no reluctance was shown by the House of Commons generally towards proceeding with the Bill. We rather complained of the leaders of the House for not attaching sufficient importance to the Bill, but at all events great pressure was brought to bear by the House itself on the Government to proceed with it, and the proceeding with the Bill and the carrying of it were the result of the efforts made on both sides of the House of Commons towards the Government. But that is a small matter as compared with the very great one which is opened by the proposals of the author with regard to the future relations between the Services and Parliament. He proposed, as I understand him, that the War Office and the Admiralty should in fact be confined to small executive functions, and that the direct relations of the two Services with the elected representatives of the nation in the House of Commons—he says nothing about the House of Lords—with the representatives of the people in the House of Commons should be conducted by means of a Board, the spokesman of which would appear before Parliament and make his own statement. He would be a permanent representative of the Admiralty or of the War Office, as I understand, who would directly represent to Parliament the views of the Admiralty or the War Office, and the Admiralty and the War Office departments would continue as executive departments only and carry out the policy of Parliament. He goes on to say what a large saving of expenditure would be the result. What does he mean? How would this proposal work? Take for example the Admiralty. Supposing this proposal was considered by Parliament as a whole, or supposing that it was referred to a committee of the House of Commons, as is the case in several other countries of the world—for example, in France, where the Army and Navy Estimates are each referred to a committee. Supposing that committee took, as I think it would take with regard to the Navy, the view that our present standard of shipbuilding was insufficient, and that a large increase of the Fleet was necessary in the present conditions of the world, who is going to be responsible for the expenditure? Who is going to shape that expenditure into the combinations of the Government and make it a portion of the Budget of the Chancellor of the Exchequer? I confess I do not see how it would be possible either for the House of Commons as a whole or for any committee of the House of Commons to take so enormous a branch of the national affairs out of the hands of the Government of the day and deal with it without respect or regard to the Admiralty in the case I have put, or to the War Office in the other case which the reader of the paper has put. The proposals do not seem to me to be practical proposals. In no country in the world has anything of the kind prevailed. The authority actually passes from the minister and the department to the Parliamentary Assembly. In France, as I have said, and in some other countries, the Army and Navy Estimates are referred to a committee. In France you have the reporter of each of the two committees who is a person whose opinion (with the opinion of his committee behind him) goes for a good deal in detail. The minister appears before the committee, the minister and the committee together thrash out the details to the Budget, and they generally come to some sort of agreement. They seldom differ sharply, but they fight on details. They do not fight on the general principles

of the Army or the general principles of the standard to be adopted for the Fleet. There is there all the time what the reader of the paper does not seem to contemplate as existing in this country in the future, the ministerial responsibility, just as there is here. The Minister of Marine in France and the Minister of War discuss the question with the committee, give their evidence, assist the committee by giving their facts, and they remain responsible and the budgets for war or for the marine as ultimately presented to the House, are still, although they may be modified in detail, the budgets for which these ministers are responsible. I cannot but confess that I fail to see that the reader of the paper has thought out his suggestions on this subject. How would it be possible for the War Office or the Admiralty to come to a committee of the House of Commons to make their proposals while the duty of the Admiralty and the War Office would become merely executive duties? And how could the policy of Parliament be imposed on the departments? It seems to me it is a suggestion quite in the air and not worthy of the consideration of those present—that it has not been thought out in detail. But it is a matter of such importance that I thought it ought not to pass in this paper without some notice, because I am certain that nothing can be more deserving of the attention of those who are assembled here to-day.

Colonel T. MYLES SANDYS, M.P. (late 3rd Bn. Loyal North Lancashire Regiment):—The remarks that I venture to offer to-day upon the able paper which has been laid before us for our consideration are only justified by the fact that I am a Member of Parliament who takes some interest in this most important question, and that I have had the good fortune to have some years' military service and experience abroad and at home. The point upon which I think we shall all agree is contained in the final paragraph which was quoted by the lecturer from the words of another authority:—"When I reflect upon the issues involved, I am lost in amazement at the indifference of the public. To what is this indifference to be attributed? It cannot be to want of information, for this subject (Imperial Defence) has been placed before them over and over again, here and elsewhere, and under every aspect; it cannot be to any inherent difficulty in the subject, for it is devoid of professional technicality, and so simple that a child may comprehend it." Well, Sir, I do not know that it is so simple that a child could comprehend it, for the lecturer, in the admirable paper he has read to us, has dealt with this difficult question in a manner which I confess has, in the short time before one for its consideration, completely taken one's breath away. I do not mean to say there are not a great many valuable suggestions in the views expressed, but they are questions of such far-reaching extent, and involve consequences so great should they not be based upon the correct principles attained by the experience of nations in war, that we may well pause before we express a decided opinion upon questions of such importance. The first point, and perhaps the most important point in the whole scheme, is the question of how, and where, we are to begin our Army reform; and it is to that point especially I would venture to address a few words, without, however, going into details as to armament, or the plan suggested for obliterating the lines which are the recognised lines of demarcation between different arms of the Service. But with reference to Army reform, it does seem to me that what we have to do is to concentrate our minds upon the bed-rock of the military machine, because unless the system which shapes our military-working machinery is itself correct in its working, we cannot expect that its effects will be good. I have given some little thought to this matter, as the lecturer perhaps may be aware, and it seems to me that where our military administration fails, is that a civilian element is allowed at the War Office to interfere too much in the military detail working of our Army system. What we want is that our Army shall be thoroughly and entirely administered by the best military experts that can be furnished from our Army, and that the man in whose hands the reins which control the working details of the entire military department should be placed is the Commander-in-Chief, who seems to be the man who should guide the whole military machinery. It may be said that it is an essential part of our Constitution that our military administration shall be subordinate to the

civilian administration. I say, well and good ; that is a constitutional principle we are all most ready to accept, that is to say, that the Secretary of State for War is responsible to Parliament for the efficiency of the Army as a whole. But because he, a civilian Minister, is supreme and controls the military administrator, who, as I say, should be the Commander-in-Chief, it does not therefore follow that there should be subordinate civilian officials in the War Office empowered to hamper the working of the military men who should control their own departments. I will point out exactly what I mean. There is an official in the War Office called the Permanent Under-Secretary. He has always been a civilian, he has had no military training whatsoever ; but the Secretary of State for War, however able and conscientious a Minister he may be, is subject to the changes of administration, while the Permanent Under-Secretary remains for ever, and his influence over the War Office is like the dead hand that can control the activity of any too zealous administrator within the War Office. Then, again, we have a Financial Secretary to the War Office, until now a civilian who has been trained for the most part in the Treasury, and who, therefore, accepts the endeavour of the Treasury to usurp the control more or less of every one of our public departments. What need have we in the Army for a Financial Secretary ? The first thing I would suggest for improvement in Army organisation is, to get rid of the Financial Secretary altogether, as an endeavour has been made to make unduly prominent, and there is already the Auditor-General for Accounts. What should be done is, that the money which Parliament votes for the Army should be handed to the military authorities, and they should lay it out and keep a proper record of how the money is expended, and this record should be considered sufficient. We do not require a Financial Secretary, because there is an Accountant-General, with an experienced staff of people under him, to attend to this matter of Army expenditure and account. That, however, is a detail of interior economy. But an important question is, how the Commander-in-Chief should be advised and supported in his position of supreme commander. We cannot take a better example than the sister Service. The Board of Admiralty is composed almost entirely of sailors—of the best men in the naval profession—and the First Lord has the advice of these naval men, so therefore the administration of our Navy, we shall all agree, leaves very little to be desired. Let us bring the same principle into the administration of our Army. Let the Commander-in-Chief be, so to speak, a military copy of the First Sea Lord at the Admiralty, and let him have a board of advisers under him, probably composed of the Adjutant-General, the Quartermaster-General, the Military Secretary, Head of Intelligence Department, Director of Artillery, Inspector-General of Fortifications, and an officer of high rank at the head of "Supply," which is what we want very much to separate from the combatant branches and others—in all, perhaps, some seven or eight officers, heads of departments of the Army—each responsible for the efficiency of his department to the Commander-in-Chief. There the Commander-in-Chief has his military Board, of which he should be the President. That Board could advise him on the working of each of their departments, and each year it should be part of the duty of the Commander-in-Chief, who, in a military sense, should be responsible through the Secretary of State for War to the nation for the efficiency of the Army, to embody once a year in a document addressed to the Secretary of State for War, his views upon the requirements of the Army in order, needful for a state of efficiency, and that document he should submit to the Secretary of State for War ; and the Secretary of State for War should himself, with his own remarks, lay the matter before Parliament, or before some body deputed by Parliament on their behalf to consider it or recommend thereon, which recommendation should be adopted of and put into practical form by the Secretary of State for War in consultation with the Commander-in-Chief, through whom all military information should reach him with regard to the Army. This, I take it, would cover the ground which the lecturer has put before us in the scheme for an Advisory Board, the only difference between us being that, instead of this Advisory Board of eminent persons who, perhaps—I may be pardoned for using such an expression—would have to be got together in a hurried way, we should have the firm experience of officers of

great knowledge, in whom the country would have confidence, headed by the Commander-in-Chief, the picked man of the whole of the British Army. His reports should pass, through the Secretary of State for War, to the Cabinet and to Parliament, embodying the whole military experience of the best men we can find. That, I take it, is the way in which the administration of the Army and the first reform of our present unsatisfactory state of things should be set in motion. With regard to details as to armament and so forth, defence, and how to organise the civil population, the limits of time at my disposal will not permit me to enter upon it on this occasion, but I am glad to have had the honour of laying before this meeting this short expression of my views in this matter, which may, perhaps, help a little in the consideration of how to approach a difficult subject of this great importance.

Colonel W. CAREY, C.B. (late R.A.) :—My excuse for standing here is that I have considered this subject of Army reform, and have even gone so far as to sendsome remarks on the subject to the heads of the Government and the Commanders-in-Chief, both Lord Wolseley and Lord Roberts. The paper, I think we all agree, is exceedingly diffuse, and goes into so many things that I must leave most of them, and go to what I consider really to be Army reform. The reform of the Army means that we should be in a position to put two or three hundred thousand men into the field at a moment's notice. The lecturer has told us that we have 5¼ millions of men available, or with deductions, 4 millions. I look upon it that we have 4 millions. My *datum* is this : I consider the population of Great Britain to be 40 millions. If I take one in ten to be an able-bodied man, that gives me in the whole kingdom four millions. But I am told and understand that the able-bodied men of the kingdom may be taken as one in eight, which would give us another two millions, and probably is not far off what the lecturer states. But the thing is, How are we to get hold of that four millions of men and make them available ? We have the Armies of Europe—Germany, Austria, and France—all able to put three millions of men in the field, if not four millions, and Russia can put about six millions. We, as our lecturer tells us, from economy, in piping times of peace go to sleep and do nothing. There is one thing we have to remember. The law of the kingdom declares that every man is available for the defence of the country, and I conclude for the defence of the Empire. If every man can go abroad, why cannot they be regulated in such a way that we can get them at a moment's notice ? I should just like to say one or two words about the Regular Army. The lecturer states that our Army is to be 100,000 men, but that is reducing the permanent Army from what it is at the present time. I understood that we had 180,000 men available, or two army corps always ready. The author wishes to have a million, and the thing is to make it up out of the Reserves. The great stumbling-block to us is the present short-service system. The men are discharged after twelve years' service, and very few are allowed to extend their service, and they are thrown out as too old. If you take it that they enlist from the age of 15 to 18, that brings them when they leave the Army up to 30. Men then are in full vigour, and even up to 40 are in the prime of life. A good many men are perfectly physically fit at 60. General Moltke worked up to 80, and our Commander-in-Chief himself is close on 70. But still all these men are cut out of the Army, and we cannot put our hands upon them. If this Militia law is to be acted upon, let us alter the system of discharging the men straight off in that wholesale way and not allowing them to come back, and let us have them back as vacancies occur, to give us their services again as they gave them to us before. It suits them to get pensions, and you would be giving some encouragement to them, and you will get experienced soldiers. Besides that, why not make use of our Militia ? Embody the Militia, but in place of embodying 100,000 men, embody 500,000 men. Tell your Militia regiments that for every two Regular regiments serving abroad one Militia will go abroad for several years, and thus learn discipline. Discipline is the great stumbling-block in our Militia service at the present moment. If these Militia regiments go abroad for six years, and get a regular training in foreign service, you will get a reserve force which will be worth something. Militia officers will feel that they are part of the Regular Standing Army officers, and the cry about having no officers will disappear. You must remember that every

man who has once enlisted ought to be available for service at a moment's notice, and consequently on being discharged with annuities, pensions, or anything else, the men should be noted as medically fit for active service or for home service, so that at a moment's notice we might be able to lay our hands on bodies of men who had served in the Army before, and thus obtain an Army within six weeks or two months such as our lecturer says we ought to be able to obtain.

Admiral E. FIELD, C.B. :—As a naval officer, I do not care to make even one observation on a military question ; but there is a naval element in this paper, and it is because of what has fallen from my old friend—and you, Sir, will have a useful word, I have no doubt, to say upon the general question later on—with regard to this new Advisory Board he proposes to establish, that makes my soul burn, and I feel like Mr. Fox, who, when walking over the gravel path in a garden, saw a snail, and could not resist the attraction of stamping his foot on it, and accordingly made a most undignified circular movement. My gallant friend says here most truly that there can be no real efficiency until the national spirit is awakened. That is true—in other words, until the nation tells Parliament that it must have a really efficient return for what it pays. Why, bless my soul ! Sir, the military element have more representatives in Parliament than any other class of society. They have a hundred soldiers, of sorts, in the House of Commons. I said "of sorts" designedly, but there are only two modest sailors left now since I have left the House. There were three. But my modesty is not such that I will not raise my voice against this absurd proposal of a military Advisory Board. I use the word "military" to mean both naval and military. I see that this famous military Board of three is to comprise two officers of the Army and one sailor —two soldiers because the Army has so many more branches than the Navy—and the Navy, he says, is so much more easily administered. That I won't dispute. There are to be two soldiers and one sailor ! Therefore the one sailor must be the most talented sailor that can be found, and I say that that most talented sailor is required at the Admiralty. Take one of the most talented naval officers out of the Service and put him on this Committee, and he will be dominated by soldiers ! I object to be dominated by soldiers ! I have to remind my gallant friend that all our institutions rest upon our sea power, and yet he proposes that this Board, which is to be formed to advise the Government and House of Commons, and to give evidence before the Committees of the House, will have two soldiers on it and one sailor ! And he expects me to swallow that ! Why, Sir, I would use strong language if ladies were not present, but they might be frightened. I have no language strong enough to use in opposition to this absurd proposal. We want the best man the Navy can produce in the Admiralty, and I affirm that those who have to administer the Department are those who ought to advise the Government as to what is necessary. This new creation of my gallant friend's mind, this wonderful Board of three—well, I know there is not a sailor who will support it, and I hope there is scarcely a practical soldier who will believe in it, although it emanates from a high military authority. I agree with everything that fell from Sir Charles Dilke on this question, and I am thankful he is in the House of Commons when there are so few sailors there who can speak on behalf of my Service. In him we have a friend who will never allow so absurd a proposal as this to appear on the floor of the House. I have nothing more to say, except to protest against this ridiculous proposal, and I hope it will be destroyed as I would crush a snake.

Captain H. M. JESSEL, M.P. (Late 17th Lancers) :—As one of the officers "of sorts" in the House of Commons mentioned by my late colleague Admiral Field, I venture to address you on this occasion. I am sorry to intrude myself upon you, because I am sure that what I am going to say would have been much better said by my friend Colonel Dickson, who is here, and who commanded with such distinction one of the Cavalry Brigades in South Africa. But what has chiefly brought me upon my legs is the attack upon the cavalry by the lecturer. He seems to say more or less that the days of cavalry are over, and judging by the experience of the South African war, that there will never be any use for them any more. Well, Sir, I think the lessons of the war have proved the exact contrary. The march of General French to relieve Kimberley was one of the most

brilliant events of the war. It is true that their horses have got to carry very great weight, but that seems to me more an argument for getting rid of the weight on the horses' backs, and devising some other method of carrying the kit of the men, than the abolition of the cavalry. There is one other point in connection with this subject which I would venture to lay before you. A large number of Yeomanry have been sent out to the war, and they have been used more or less as mounted infantry. It is now proposed, I understand, by some high authority, to convert the whole of the Yeomanry in this country into mounted infantry. I hope and trust that before a decision is finally arrived at some consideration will be given to the other side of the case. We who have had some little experience of the Yeomanry know perfectly well that we get men to join because of the cavalry spirit; they are trained up in the traditions of the cavalry. I may say, of course, that this has nothing to do with mounted infantry, but I can assure you, and all the officers who have come back from the war will tell you, that the men who have enlisted as Yeomanry have been the most efficient mounted infantry. It is very much more difficult to train a man to be a cavalryman than it is to be a mounted infantryman, and surely if you can train him to do the higher work it is much easier when he has to learn mounted infantry work, to have a man who already knows the cavalry work. Then again, mounted infantry fall off as regards scouting. The cavalry soldier is the eyes and ears of the Army. The whole essence of the two is different. A man to be a cavalryman has to be thoroughly trained in looking after his horse; the mounted infantryman regards his horse as a machine, something like a bicycle, with which to get about in the country from one part to another. It seems to me that we must keep up our cavalry, and must also have mounted infantry, bodies formed here at home of regiments, and not companies gathered from here, there, and everywhere. I was talking on this subject the other day to some distinguished officers who have come home from the war, and they said that to increase the mobility of cavalry it would be most useful if they had with every brigade half a battalion or a battalion of mounted infantry. The mounted infantry would be able to keep up with the cavalry, look after the stores and baggage, and provide a guard over the camp while the cavalrymen were in the field. I am only too glad to be able to say a good word for my old force, in which I was so proud to serve for some years. Then the lecturer talks about Army reform, and asks how we are to begin it. As has been already pointed out, he has advised the creation of an Advisory Board. I am sorry my friend Colonel Sandys has left, because he talked as if the creation of an Advisory Board was some new thing. Why, Sir, we have at this present moment an Advisory Board. The Commander-in-Chief has a Council composed of high officers to advise him, and my humble opinion is that the quickest way of getting Army reform would be for the Commander-in-Chief to be relieved of the position in which he is at present, of only being *primus inter pares*, and reverting to the position in which he was before the order creating the Army Board came out. The position now is, that the Commander-in-Chief, instead of being absolutely responsible for everything that goes on in the Army, as he used to be, is only one of a number. In principle the Adjutant-General, the Quartermaster-General, the Inspector-General of Fortifications, can all go direct to the Secretary of State without informing the Commander-in-Chief. Well, gentlemen, most of us here are or have been soldiers, and we perfectly well know how pernicious it would be in a regiment if the major, the squadron commander, or the company leader could go to the general without informing his commanding officer. It seems to me that the very essence of Army reform most be that the Commander-in-Chief should be the sole adviser of the Secretary of State for War. It appears to me that before long Lord Roberts will himself see that. In answer to a question in the House of Commons we were told that he took the position of Commander-in-Chief under the old conditions, and he himself will, I am sure, see that the present system is not practicable. Officers should be responsible to the Commander-in-Chief, and the Commander-in-Chief should be responsible to the Secretary of State for War. There is only one other point, and that is, as to how we are to get the men for the Army. There is no doubt that after this war there

will be a great difficulty in getting men to supply the place of those who return to civil life. After the excitement of war has ceased, and when we are in times of quiet, we who are friends of the Army will have to take great care that the interest that is now shown in the defenders of this country should not cease. But above all, there is one point which I think should be borne in mind. The standard of comfort of the civil population of this country has increased enormously within the last few years, and the Army authorities do not do enough to make the soldier comfortable at home. I go as far as to say that the state of many of our barracks is a positive disgrace; the lighting, the system of cooking and the manner in which the men's meals are brought to them, and in many other ways, we are behind a great many of even the fifth-class military Powers in Europe. It is of the utmost importance to us, who have to appeal to voluntary agencies to get our men, to make those men as comfortable as possible in our barracks. I believe that the comfort of our men will be one of the main incentives to getting recruits. I hope that in the Army, although we may look forward to having a better uniform in the field, there will be no great reluctance to having one smart dress for the soldier. The German soldier has five different sorts of kit, and in this country, where the uniform excites so much respect for its historical traditions, it nowadays enables us to obtain a large number of recruits. We are told that on account of the South African war the whole of the Army must be put in khâki. That is a great pity. I think we should make a mistake by taking all our lessons from one war in one particular place. The Germans are devising a sort of grey costume for their soldiers. What I do hope is, that in the first place the authorities will see to the comfort of the soldier at home, and secondly, that, while providing a good workmanlike dress for the field, they will not lose sight of the importance of having a smart dress for the soldier in time of peace.

Mr. LEEDHAM WHITE:—I am one of many civilians who take a sympathetic interest in the Army. I was struck by the last paragraph of the very able paper read by General Webber. He quotes an authority who expressed wonder at the lack of enthusiasm on the part of the public for Army reform. I do not think that the cause of this is far to seek. I have been repeatedly told by working-men among others that they would warmly advocate reforms in our military system and even face the possibility of some sort of compulsory service if they were told on competent authority that such measures were necessary. But at present military opinion speaks with an anything but united voice on these matters, and until we are clearly told by some large and powerful body of military experts, speaking on behalf of the Army with entire unanimity, what reforms they think are wanted, and especially whether compulsory service is or is not in their judgment necessary, we shall make no impression on the British people. I believe that the depths of patriotism of our nation have never been sounded, but it is useless to appeal to that patriotism until the experts to whom we look for light and leading can agree upon and frame a programme for us who do not profess to be experts, which we can boldly set before the people. Supposing that such a programme were to include some sort of compulsory military service, I venture to make a suggestion for consideration. It is much easier in our country to set in motion an old law than to pass a new one, and though admitting that ballot for the Militia is a clumsy way of attaining our ends, it may perhaps be the best practical means of doing so. I would therefore suggest revival of the Militia Ballot, allowing one important addition to the exemptions which now exist, viz., exemption on production of a certificate of efficiency in the Volunteers. It is thought that this would somewhat benefit the Militia, especially if the Militia were no longer made a feeder to the Regular Army. But it would have an even more important result. It would drive shoals of young men into the Volunteer Forces in order to escape ballot for the Militia, and then the Government could raise the whole standard of efficiency of the Volunteers and convert them into a force really adequate for home defence. It would also indirectly compel employers of labour—and I speak as one of them—to give their employees greater facilities for military training, and this is a most important matter. I should like to say a word in conclusion as to the foolish assertion which I have heard made, even by soldiers, that even were compulsory

service universal in our country it would damage trade. As one somewhat familiar with manufacturing opinion in Germany, I do not hesitate to say that German manufacturers are pretty well agreed that one great factor in the huge development of German industry is the excellence of their working-men, who have acquired, through military service, smartness, intelligence, and amenability to discipline, in which our labourers and mechanics are somewhat deficient. I am not assuming that we require to pass everyone through the military mill as in France or Germany; but from the abstract point of view the British working-man, and his employer too, for the matter of that, could get only good from it. The British working-man is a good fellow as it is, but if he were passed through the military mill he would be an even better one still.[1]

Colonel J. B. B. DICKSON, C.B. (late Major-General commanding a Cavalry Brigade, South Africa) :—I had no intention of speaking this afternoon, but having been called upon by name to defend the reputation of the cavalry, I have much pleasure in saying a few words. My friend General Webber in his interesting lecture quotes a German officer as having spoken disparagingly of our cavalry, but General Webber might use the same argument to disparage our mounted infantry or any other branch of the Service. During the time that I had the honour to command a brigade in the Cavalry Division during some eight months of almost daily fighting no disasters occurred to it, no surrenders took place. You say you heard very little of the cavalry. Well, in the capture of Bloemfontein, Kroonstad, Pretoria, and other towns you will find on inquiry that what contributed most to the fall of these places were the long flank marches and turning movements of the Cavalry Division which, carrying out the orders of Lord Roberts, almost invariably worked round in rear of the towns or positions before the arrival of the main army. Then, again, I doubt if the cavalry of any other nation would have attempted and successfully carried out the march to Barberton, where the country was pronounced by experts to be quite impossible for mounted troops. With regard to the arming of cavalry with only a long rifle, I am absolutely opposed to the proposition. Sir Charles Dilke's remark that this South African campaign is an exceptional war is very much to the point. We may no doubt derive much advantage from its lessons; we must not forget that the Boers though mobile and mounted had no cavalry to oppose ours. There have been several occasions when our cavalry have charged the Boers, and almost invariably with success. In my opinion, one of the lessons to be derived from the campaign is that the want of cavalry on the part of the Boers has been fatal to their success. It has prevented them from following up the advantages they have frequently obtained. The dread that the Boers have for the *arme blanche* has paralysed their initiative; whilst, on the other hand, I would submit that the value and adaptability of British cavalry have been clearly demonstrated. It has, with its horse artillery only, moved over thousands of miles unsupported by other arms, sometimes making sweeping reconnaissances, sometimes with a brigade dismounted holding positions against superior forces of the enemy, whilst another brigade moved round and turned the position, taking town after town, reminding one of Lord Peterborough's campaign in Spain.

Sir HENRY HOWORTH, K.C.I.E., F.R.S., M.P. :—Perhaps you will tolerate another civilian for a minute or two. I spent many years in the House of Commons with you, Sir, and have written something on this subject, and I should like to say a word or two to try and bring back this discussion, from what I think are rather dissipating tendencies, to the real issue before us. I think my old friend General Webber has been a little ill-used. He has read a paper full of every kind of suggestion, a great many suggestions which are very fresh and new to some of us, and although no doubt there is the possibility of a critical attack being made upon particular phases, I think we shall all agree that it has been an admirable peg upon which we can hang a very good discussion. What I am afraid of is that opportunities of this kind, which so seldom occur, may be lost. What we everyone of us feel is the absolute necessity for some change, and we ought to be thankful to those who propose something definite and do not merely act as critics.

[1] Were Ballot for the Militia revived, no substitutes should be allowed. The people will never stand compulsory service if any class distinctions are made, or if the rich man can buy himself out of his obligations to serve his country.—L. W.

A good deal has been said about a consultative council which is to assist the Commander-in-Chief with its advice. I do not think myself it would be quite practicable in this country, but it must be remembered that in France they have an exactly similar council consisting of seven general officers, five of whom command the army corps, and two being without actual command at the time. I do not quite think it would work here. What I feel to be the great need of our Army is the want of responsibility somewhere. I do not care very much where you attach that responsibility, if you can get anybody to be responsible. I have raised the issue often in the *Times* and I have been always answered in the columns of that paper and in the House of Commons when I have asked questions, to the effect that the matter was one in which the Secretary of State divided responsibility with the Commander-in-Chief. Now, we want to attach it to somebody, either to the one or to the other. When you come, however, to the practical question of how you are to apportion and fix the responsibility when you insist on having a civilian Minister who is the Parliamentary mouthpiece of the Army and a separate man who has to be responsible for internal discipline and internal administration, the difficulty in this country is stupendous. For this there are two reasons: in the first place, because of the existence of the House of Commons itself with its continued criticism; and, in the second place, because we have to provide an Army such as was never provided before by any nation, except our ancestors in military matters, the Romans; that is to say, we have to provide an Army not merely to fight in England but in India or South Africa, and may be in Canada; for work in so many countries with so many varied conditions we ought to have a separate Army in each which is trained on the spot, which has an Intelligence Department attached to it on the spot, which has horses ready salted and acclimatised, and which do not therefore die immediately we send them out from this country in thousands. An army on the spot ready to face the conditions of the climate and the conditions of warfare in any part of the world cannot, it seems to me, be supplied ready-made from a centralised bureau. It seems to me that whatever reform you have in this country you will have to decentralise one or two of the great commands. We shall have to depend a great deal more on locally recruited armies than we have done in the case of two or three of these great dependencies. We are getting them in Australia, but we ought to have had them at the Cape. It was an outrageous disaster for this country that when we began this war there was not a single map or plan of Natal or the northern part of Cape Colony worth the paper it was printed on. We ought to have had these maps years and years ago, and they would have been made if we had had part of our general staff out at the Cape and had had a portion of our Army not only doing service at the Cape but prepared by local knowledge to face a war which was inevitable, a Local Intelligence Department and staff provided with trusty scouts, guides, etc., etc., as well as local information. I have discussed these matters with German officers, and they all point out that the conditions we have had to face are entirely different from the difficulties I have pointed out now. With Continental Armies it would be quite possible and easy to concentrate the whole responsibility in the hands of a commander-in-chief, to put him in Berlin, or in Paris. He would simply have to control a great territorial army within a ringed fence which could be managed and controlled by very simple rules. Yet it is remarkable that in no Army known to me is there a Commander-in-Chief at all except the Sovereign. When you come to face what we have to face, and what the Romans had to face in old days, viz., to fight under different conditions in almost every part of the world, to have great dependencies which must be protected, and where at any time we may have difficulties, it is impossible, it seems to me, to make a centralised command, as could be done in Germany, France, or Russia. Sir Charles Dilke is a good friend of the Army in the House of Commons. He is always moderate and judicial when he talks on this subject, and never gets up to speak without getting a hearing. He has the active sympathy of the men there who care most for the Army, but I sometimes wish he would propose some definite changes instead of devoting himself so completely to criticism. I was very glad to hear him emphasise once more the mistake that would be made if we made this war at the Cape a measure of the wars

that we may have to face in future. People forget that Napoleon fought a war in the Tyrol in which he was absolutely baffled by a few mountaineers for years. The Russians for years encountered a mere fragment of mountaineers in the Caucasus under Schamyl, their great chief. And what did the marshals of France do against the armed Spanish peasants in all parts of the Peninsula? This kind of thing is an exceptional incident in war, and if Napoleon after he came back from Egypt, where he had to face an entirely new condition of things in the Mamaleuke cavalry, against which he fought, had remodelled the whole of his cavalry, and had operated against the Hungarian and Polish horsemen, whom he met at Austerlitz with a cavalry modified according to the special conditions he had met with round the Pyramids, we should have thought him stark mad. It seems to me we must beware of taking all the lessons from this particular war in Africa and importing them into Europe. We have learnt much that is universally true, but some of our lessons are only locally instructive. I think Colonel Dickson and my friend who is an ornament both to the House of Commons and the Yeomanry, who criticised General Webber about the cavalry, somewhat misunderstood him. I did not hear General Webber say a word in the way of disrespect of the cavalry. What I heard him say was—and having written a great deal about cavalry in a history in four volumes devoted to the most wonderful cavalry that ever overwhelmed the world, I cannot help agreeing with him in much that he said—that he urged that the old-fashioned cavalry, the sort of cavalry which our greatest cavalry general, Cromwell, commanded, the heavy cavalry which won the battle of Naseby, the heavy cavalry that fought so well at Waterloo and Wörth, that kind of cavalry is doomed. ("It has gone.") It has gone, exactly. That was all I understood my friend, General Webber, to say. I believe cavalry will be a great arm in the future, but it will be cavalry armed with rifles and carbines rather than lances and swords. You will perhaps pardon me these scattered remarks. My friend Admiral Field, on my right, is a breeze in himself. Whenever we were dull or downhearted in the House of Commons he raised our spirits immediately. He has a habit of talking so pleasantly until he talks us away to the other side of the Channel, and I thought we ought to tack back to the very serious position which we have to face. I wish sometimes there was less criticism and more definite and useful suggestion made. If I may slightly alter an old proverb, I would say that Growler is a good dog but Holdfast is a better. I am sure we ought all to be very grateful to General Webber for giving us an opportunity of partially sifting a very difficult issue.

Colonel R. H. VETCH, C.B. (late R.E.):—At this hour of the afternoon I do not propose to discuss in detail the interesting paper we have heard read, because it is one actually bristling with argumentative propositions, and I shall make my remarks as brief as possible. When I see such an unusual attendance of members and ex-members of the House of Commons present, I feel it is an opportunity that should not be lost for the members of this Institution to speak out; and I am inclined to believe that my old friend General Webber, in proposing his Advisory Board, was not altogether serious, but he has certainly thereby managed very dexterously to catch many of our representatives in the House of Commons. Now, Sir Charles Dilke has scoffed at the remarks of the lecturer on the Advisory Board—and, for myself, I believe such a Board to be quite impracticable—but he has not attempted to meet the difficulty on account of which General Webber's Advisory Board was proposed. I quite agree with the last speaker that this is a very important question. The point is that, whether you have the present constitution of the War Office with a Commander-in-Chief as one among many to advise the Secretary of State, or whether you make him, as he was a few years ago, head of the military side, subject only to the Secretary of State, in each case you still have the great difficulty of Party Government. How are you to get the views of the Commander-in-Chief properly communicated to the House of Commons? Sir Charles Dilke did not help us in that difficulty. How are you to get the interests both of the Army and of the Navy properly represented to the House of Commons? If the Commander-in-Chief represents to the Secretary of State for War certain wants of the Army, the Secretary of State for War may say:—"That is all very well, but we have not got the money." When the War Minister goes for his annual requirements to the

Chancellor of the Exchequer, he is told :—"No, I cannot give you more than so much." That being the case, what is to be done? How is the House of Commons, how is the country to know that the Estimates presented to it do not represent the requirements of the Services? That is a point on which I think we want some information from gentlemen of the House of Commons—how can we get a step further? For myself I see no practicable way of doing it as long as we have Party Government in England, and the Services are dealt with on Party lines. I look forward, however, with a bright hope to a future time when we may have an Imperial Defence Council composed of statesmen from our own Government and the Governments of the Self-Governing Colonies, which will not be subject to the House of Commons, but which, with the assistance in the Council of high technical advice both from the Army and the Navy, will be in a position to lay down authoritatively what is necessary for the defence of the Empire, and to have estimates prepared; which will also have power to apportion the cost between the different parts of the Empire on some defined system agreed upon. Such a Council would be in touch with the Foreign Office and with the political necessities of the day. Then each Colonial Government and the Government at home would have a Bill presented to them by the Imperial Defence Council, which Bill might be accepted or not; but whether accepted or not, the Parliaments and the people would know all about it, and that is the great point. If Parliament really know what is wanted and refuses the money, it will be done deliberately in the face of the authoritative opinion of the Imperial Defence Council, and we shall know for what reason. But how the real state of affairs can be brought to the knowledge of the House of Commons is a point on which we are very much in the dark, and are desirous of being enlightened; and I am sure we should be glad to hear from any Members of the House of Commons a few words on this subject.

Lieut.-Colonel E. GUNTER, *p.s.c.* (late East Lancashire Regiment):—I was about to make some remarks similar to those of the last speaker, but, as he has spoken, I will simply second what he has said in this way: I do not think that any paper on Army reform can be considered complete unless it deals practically with the questions of the day, and one of the most practical and difficult questions is, how to find the number of men necessary for an efficient Army. The lecturer says that there are a large number of men, Militia, Yeomanry, and Volunteers, which he reckons at a million, available for Home Defence. I venture to think that it is a mistake to lump the Militia, Yeomanry, and Volunteers in that way. I think that the basis of any strong Home Defence must be our Militia. Our Militia must be raised to an adequate strength to enable it to carry out its duties as a defensive force, but it must be completed with artillery and transport, and it must be properly organised in Divisions equipped and trained. I do not think that you can put the requisite number of Militia at less than 200,000 or 250,000 of thoroughly trained men. Now, as far as our experience goes, we cannot get that number of men, and we shall not get them by the system of voluntary enlistment. If we could get them by the system of voluntary enlistment which has been allowed to be in force for so many years, well and good; but if not, I think that the ballot for the Militia in a modified form should certainly be put in force. It would not be a great hardship to enforce it. The numbers of Militia recruits to be furnished annually by each county should be based upon the population of the county, each being required to furnish its quota. Then, if by a certain date the numbers required were not forthcoming voluntarily, the ballot should be put into force in that county. All the recruits should come in together at a certain time of the year, the early period of the year, not as at present at different times in different parts of the country. It is a fact that sometimes a man is a Militiaman in one county at one time of the year and later on he is a Militiaman in another county, and therefore, for two men on paper, you have only one man in the flesh. The main thing is, under proper precautions and with very few exemptions, to put in force what I consider, and a great many officers consider, necessary to bring the home Army up to its requirements, viz., the modified Militia Ballot Act under such restrictions as may be necessary. I think, with Mr. White, that every man within certain ages should be liable to be drawn unless

he is an efficient Volunteer, of course exempting such men as clergy in actual office and some few others. I do not think my artillery friends would much relish the idea put forward by the gallant lecturer that when a man is not good enough for the infantry he should be relegated to the artillery. Artillery is an advanced science; you require very good men for gunners.[1]

Colonel G. B. B. HOBART (late R.A.) :—I rise because no artillery officer on the active list has risen to make any remarks upon what the talented lecturer has said. General Webber being one of my best friends in the Army, I am very sorry to criticise anything he has said, but it would be wrong if somebody in the artillery did not take exception to those remarks in which he has given an inferior position to that important branch of Service. I am sure General Webber did not exactly mean that, but he did appear to imply that a marksman with a gun on his shoulder must be superior to the man with a gun on wheels, and in fact to any other branch of the Service. Cavalry and infantry officers have already defended themselves, and artillery officers must, therefore, stick up for their own branch of the Service. I feel certain the audience would not agree with General Webber if he means to infer that artillery service, whether horse, field or garrison, is to be learned in a hurry by anybody who is not good enough to hold a gun on his shoulder. In the present war the artillery has been second to none, as the whole British public recognises, and I am sure the lecturer would not wish to put a difficulty in the way of recruiting for the Royal Artillery by lowering the status they have always held with credit.

Major-General WEBBER, in reply, thanked the meeting for a patient hearing of a paper on subjects so wide in their bearing on Army reform, and so open to criticism. He had listened with much interest, but did not think Sir Charles Dilke and some of the speakers had quite gathered the meaning and direction of his proposals. Sir Charles took him up on the question of the personal load of the engineer and artilleryman, with a rifle, bayonet, and ammunition, being non-essential. He (General Webber) did not say that these men should have no weapon, but he had deprecated their having a weapon the use of which would tempt them away from the work for which they were specially trained. Sir Charles Dilke applied (perhaps regardless of the meaning) the expression "fighting soldier" and "fighting man" to those who "kill with projectiles," and did not seem to admit that those who kill and disable, or who assist in doing so, by means of all the *other* forces of nature, are also "fighting soldiers," and, like the clever debater that he is, used the speaker's proposal to engage a portion of the non-combatant population in works of Home Defence to support an argument against something the paper, if carefully read, will be found not to contain. Sir Charles Dilke, Captain Jessel, and Colonel Dickson will, he hoped, read again his remarks as to the soldier on horseback of the future. They suggest that he drew his conclusions about cavalry, namely, as organised and equipped in European Armies, as a separate "arm of the Service," from South African warfare; whereas, if anything should be clear from his paper, it is that he refers to South Africa as the ideal ground for so-called cavalry, and that his allusions to South Africa as the field from which he has gathered his "lessons" are almost *nil*. The frequent reference to "mounted infantry" in the discussion as being the same as the "mounted rifleman" leaves his arguments entirely untouched and unanswered. To repeat, the speakers wholly overlooked the fundamental groundwork of his propositions. They never touched on his contention that whether mounted or on foot, whether using a rifle from the shoulder or carried on a vehicle, all those who deal with projectiles constitute the same "arm," and that the proper sub-classification is that which allocates the use of the rifle fired from the shoulder to men capable of being trained to so skilful a use of it, whether they are foot or mounted soldiers, that the useless waste of small-arm ammunition under the present system shall disappear. Colonel Bertie Hobart implied that this classification meant relegating the artilleryman to an inferior position. General Webber failed to see that, because the use of a rifle is

[1] It was so late in the afternoon that it was quite impossible to enter into the many debatable questions involved in the lecture.—E. G.

relegated to a skilled marksman from the shoulder, the skill and prestige of the man who works the rifle carried on wheels are depreciated. The engineers might equally complain that, because his classification of their duties in, and their share of, the work of an attack of a position, prescribes that their whole attention should be devoted to providing cover for the riflemen, therefore there would be something *infra dig.* in the *rôle* which he allots to them. He was surprised that Colonel Dickson suggested that the "scouts" to whom he referred in his programme for an attack of a position are mounted. Colonel Vetch was the only speaker who seemed to grasp the meaning of his description of the need for, and duties of, an Advisory Board, not, as Sir Charles Dilke said, to "the House of Commons only," but to Parliament. He could quite understand that our legislators, who pick up their views of military matters anyhow, or nohow, view with suspicion the suggestion of being advised. It almost leaves on the mind the suggestion that exact information is not palatable to them. It is very difficult for them to realise that they can ever get at the truth except by conflicting evidence as to fact. They are so accustomed to expect only part of the truth on any subject from the Government in office, that they do not believe that any board of professional men could be brought together whom they could depend on for advice. His proposition made no suggestion that the body, which he suggested should be brought into existence, ought to control or supervise the administration of the machinery or the expenditure by the War Office and the Admiralty, any more than a consulting engineer decides on the use to which his advice is put by a Board of Company Directors. How does the proposal affect the responsibility of the Minister who controls the expenditure, or of the Commander-in-Chief or Board of Sea Lords who carry on the business of each department? At present there is *no* source from which Parliament can obtain advice as to the military policy it should dictate to Ministers, which is now vitiated by party considerations. Not a single speaker has tackled that absolute fact, or combated his contention that it is a disastrous condition of things. If Colonel Sandys will really concentrate his mind on the bed-rock of the military machine, he will, General Webber thinks, see that such a consultative and advisory independent Board as is described would speak with no uncertain voice to the nation as to the civilian control under which our military departments subsist, and that the nation would insist on that advice being taken. All who have passed through the mill of departmental life admit without hesitation that, with an absolutely autocratic Commander-in-Chief, independent of Ministers and only responsible to Parliament, uninfluenced by Party politics, we should have all that is needed to eliminate, the innumerable disabilities to efficiency, to the prevention of waste, and to the creation of the best military sea and land machines. Subject to human fallibility, this would provide the "ordinary business principles" which the man in the street cries out for. But the idea is repulsive to all our institutions, and would not be accepted for a moment. And yet, while Parliament denies this facility, it leaves the nation in the dark to fumble about as to the why and the wherefore of half the miscarriages and breakdowns of a machine, which (to use an engineer's term) hardly ever "runs with a full load." The speaker added that, if he may have the opportunity, he hopes to submit a separate paper, going in detail into the functions of such an Advisory Board, when, perhaps, his meaning may be more clearly driven home, and when his contention may be seriously understood and discussed. His friend Admiral Field's consideration of his proposition, he regrets for the admiral's sake to say, was paralysed by the suggestion that one admiral is, in deliberation, as strong as two generals. He hopes he is not too bold in thinking that his paper of to-day deals only with the preliminaries of his views on Army reform.

The CHAIRMAN (Captain Sir J. Colomb, K.C.M.G., M.P.):—My main duty in rising is to propose, what I am sure you will heartily endorse, a hearty vote of thanks to General Webber for his suggestive and instructive paper. I agree with some of it and I disagree very strongly with a great deal of it. As regards his proposals respecting an Advisory Council, I am in thorough accord with Sir Charles Dilke. The real truth is that, however much we recognise the evil of Party Government and resulting expense and wastefulness, when we come to practical

arrangements we have to acknowledge it. An Advisory Council such as is proposed in the paper would in effect be, as Sir Charles Dilke has forcibly said, simply to deprive those who must be responsible for the Government and the expenditure of the country of all responsibility. That is a state of things that could not be allowed within the Constitution. I am bound to say I do not despair of finding, within the Constitution, a way of getting out of the want of continuity of policy and the pursuance of principle in our naval and military arrangements, as time goes on. I may say I think what Colonel Vetch said with regard to an Imperial Council is in the direction of the ultimate true solution of the difficulty. I may also say, if I may presume to give an opinion on a mere technical point, that I cannot see anything in the present war tending to alter the character and necessity of cavalry as an arm. I can quite see that everything is pressing towards a greater proportion of infantry being mounted. I cannot see that we are taught any reasons for supposing that cavalry as an effective arm is doomed. I think we are all greatly indebted to the lecturer for putting a paper so full of suggestion before us, and to get the value of the paper you have to read it very carefully rather than listen to it once. My broad objection to the paper in principle is this, that I think the author lays far too much stress upon arrangements for the hedgerow defence and the internal defence of this island. He says that the Duke of Wellington recognised the increased facilities for invasion provided by steam, and then he goes on to state that facilities far beyond the Duke of Wellington's conception have been continually added since his time. My conviction is exactly the opposite. In the Duke of Wellington's time men's minds were confused altogether about the consequences which would follow the introduction of steam, and what has happened since is simply that the economic condition of the country has changed, and not naval principles. For the purpose of our invasion it is necessary for any Power or combination of Powers to have a sufficient number of ports sufficiently quiet in which to collect at leisure and embark a vast army, to concentrate undisturbed the great flotilla outside them, for the forces must proceed from different ports of issue and to disembark the army free from naval interruption. But the economic conditions of this island are now such that these operations would be impossible, unless we have ceased to have commercial existence. The part that interests me in all this question of Army reform most is the consideration that, after all, our military arrangements must be subordinate to and dominated by one fact, viz., the necessity of maintaining, for economic reasons, our sea power. My gallant friend Admiral Field was very strong upon the fact that two soldiers and one naval officer should be on the Advisory Board. I do not care about individuals, whether they are naval or military men, but what I feel very strongly is that we have to recognise that we are a sea Empire, and that we cannot stand in the future unless we can combine all the resources of the Empire for standing solidly together to secure the control of our sea communications, which means command of the whole seas. That being so, it must be recognised that the Army is the necessary weapon of offence, and Army reform must be based upon that fact. The Army is an arm to strike enemies over sea, not to defend the hedgerows of this country.

TO INDIA:
MILITARY, STATISTICAL, AND STRATEGICAL SKETCH.—PLAN OF FUTURE CAMPAIGN.

Translated from the Russian of B. T. LEBEDEV,

By Lieutenant H. C. HOLMAN, 16th Bengal Cavalry.

[For "Introduction, First Campaign and Seizure of Herat," see JOURNALS for November and December, 1899, and January, 1900.]

(Continued from p. 271, March, 1901, and concluded.)

"The more powerful Russia becomes in Central Asia, the weaker does England become in India, and, consequently, the more amenable in Europe."—*A. Sobolev.*

CHAPTER XVIII.

THE THIRD CAMPAIGN.—GENERAL PLAN.

The distribution of our forces at the end of the second campaign will be as follows:—38,000 in Kabul, and on the lines of communications with the Turkistan military district 10,500 (not including the troops left in the Turkistan military district itself); in Kandahar 67,500, and on the communications with Herat 57,000 men; and in the Chitral and Gilgit columns 7,000.

Taking into consideration that the English Army, under present conditions, can be increased to 230,000 (140,000 of the actual army in India + 90,000 reinforcements from England), that we shall have to waste a considerable force to safeguard our communications from the line Kabul-Kandahar to the Indus, also the whole of our rear, keeping in mind the exceedingly great difficulties of an advance through a wild and desert (unfruitful) territory, inhabited by robber tribes, and then the occupation of the land along the right bank of the Indus, after the English have been forced back to the left bank, we should allow for the advance to the Indus forces at a minimum as strong as those of the enemy.

By strengthening the above-mentioned troops by the addition of five divisions from the Caucasus, or out of European Russia, we shall be able

to employ for the advance to the Indus 230,000 men (two divisions will be left to guard the base, and the line Kandahar-Herat).

In order to carry on our operations to the Indus, it will be imperative to hold behind us the line Kandahar-Kabul and make a base on it ; the holding in our rear of only one of these places would lead to a one-spot base and to all the disadvantages connected with this, viz., our army, in the event of a disaster might be forced away from its one line of retreat.

Again, if our troops have only one or the other of the above-mentioned points, this will untie the hands of the Afghans, and will create a serious enemy on the flank and in the rear of our army operating towards the Indus. Having thus decided on a base on the line Kandahar-Kabul, let us examine the question as to which we should consider our main line of operations to the Indus.

Some have expressed their opinion, and among them, as we have already seen, MacGregor, that the advance should be from Kabul and Ghazni, by the shortest road to the Indus, which entails a concentration of the movement, and allows the enemy to threaten only our right flank, and this flank can be secured by having a sufficient number of troops before the English in the fortified camp at Pishin. But the concentration of the main body at Kabul and Ghazni has its enormous disadvantages ; let us enumerate them :—

1. Bringing up provisions to Kabul will take place only along one difficult road over the Hindoo Koosh (not to speak of the four winter months, when any considerable traffic over the mountains is hardly possible) ; we should have to abandon any supplies from Kandahar, as the whole road from that town to Ghazni, some 500 versts, is exposed to flank attacks by the enemy ; also the local supplies would not be sufficient to support a large army.
2. Having a broad base, but determining to advance from only one point in it, has no advantages, as it entails only one line of retreat ; in fact, it is impossible to decide to retreat on Kandahar while we have in our rear the English corps at Pishin ; so there remains either to move at first on Ghazni, and then by a flank march to Kandahar, which, if not altogether impossible, will at all events be exceedingly difficult—or to retreat to Kabul, if the enemy allows us.

Thus the concentration of our main body at Kabul and Ghazni will lead practically to our having only one line of retreat, and that a very difficult one ; also, under these conditions, leaving troops to guard the line of communications, Herat-Kandahar, brings no actual advantage and only weakens our main body.

This main idea of the plan of the third campaign should, in my opinion, be the following : The moving of the main force from Kandahar to the Indus, whilst guarding our right flank by troops in the Pishin fortified camp (having, of course, previously captured the same from the English), and by a firm hold on Kabul.

The disposing of 60,000 of our troops on the line Kabul-Ghazni will enable us :—

1. To keep the whole district in subjection.
2. To show serious resistance to any forward movement of the enemy towards the capital of Afghanistan.
3. Under certain conditions to give assistance to the forward movement of the main body by securing its left flank from attacks by the enemy from the direction of Zarmelan-Gomul.

After telling off 60,000 for the Kabul army, and 7,000 for the Chitral and Gilgit columns (if necessary, they could be made stronger), we should have at our disposal for the operations from Kandahar an army of about 160,000 strong. For the operations to the Indus it is necessary to securely guarantee the safety of our rear, as the army with everything necessary will be contingent on bringing up supplies from the base, for it would be very risky to rely on the supplies furnished by the country itself; and the base, as our army approaches the Indus, will be about 600 versts away from the forces.

Besides that, we must remember that all our probable allies, namely, the population of the country we shall pass through, will become our adversaries as soon as our success changes into defeat. Hence the safe-guarding of our rear is a matter of vital necessity.

Our first step towards the Indus will be the wiping out of the opposition offered by the English troops in the entrenched camp at Pishin, which will entail using a considerable force, which alone will guarantee quick and decisive success. It will be more convenient not to weaken our army by telling off the above-mentioned force to act against Pishin, but to select a line of operations for the whole Kandahar army *viâ* Pishin, and this all the more as Pishin is the meeting-place of all the roads leading east. Having captured Pishin, the Kandahar army, before moving on, will have here a force 40,000 strong, which will make Pishin its pivot for manœuvres in various directions, and will also occupy and fortify the passes towards Karachi (where the English reinforcements will be landed) and Sukkur, and which will have as its main problem the guaranteeing of the safety of the rear and flank of the main army from the directions of Karachi and Sukkur. This corps, if there is absolutely no danger to our rear, might reinforce the main army with part of its forces.

On the line of operations from Kandahar *viâ* Pishin to the Indus, the two roads to Dera-Ghazi-Khan are the most convenient, as they will allow an army 120,000 strong to move by two roads, some 40 to 50 versts apart, right up to the Indus Valley.

These roads are :—

1. The Northern, by the valley of the River Borai and the Saugar Gorge.
2. The Southern, *viâ* Hernai, Thal-Chotiali, and the Sakhi Sarvar Gorge.

They are the most convenient ones for moving considerable bodies of troops along, and they have also a sufficient number of cross-roads uniting them, which will allow the troops moving along them to support one another. Besides the roads we have already mentioned from Pishin, there are two other roads from it along the valleys of the Kundar and Zkhob Rivers, leading into the valley of the Gomul River. Besides the poverty of the country through which these roads run, and the want of water along the first road, they both present great drawbacks, as an army of 120,000 men would have to move either along one of them, or along both, and, under the first of these conditions, there will be absolutely unconquerable difficulties from a provision point of view, as also from a tactical one, in consequence of the great depth of the column, which would also put rapid concentration out of the question; while, under the second condition, besides the difficulties one of the portions of the army would be under from want of water, the tactical difficulties would be increased, as the touch between the two portions of the army would be lost, in consequence of moving along two roads separated by a tract of land, in places 100 versts broad and full of mountains, there being also very few cross-roads. If it still appears possible to move on the Indus, along roads leading to Gomul, then other roads running southwards, except the above-mentioned roads to Dera-Ghazi-Khan, are absolutely worthless for this object: in the first place, because they run through a sparsely-populated, barren, and waterless desert, which would quite exclude the moving along them of considerable masses of troops; secondly, they would have to traverse a part of the Indus where it is very difficult to cross, owing to the breadth of the stream; and, thirdly, east of this part (of the river) lies the broad desert of Rajputana; whilst, in the fourth place, an advance along the southern roads will lead to the widening of the general strategic front of both armies, and will prevent their concentrating in the valley of the Indus.

Before setting forth the further plan of operations in greater detail, let us sketch the probable distribution of the English forces for the defence of the approaches to the Indus. MacGregor, as we have already seen, proposes, until the situation of affairs is cleared up, to divide the Anglo-Indian Army, 240,000 strong, in the following manner: 30,000 in Jelalabad, 30,000 in Pishin, 30,000 in Gomul, and in reserve 50,000 in Rawal Pindi, 50,000 in Lahore, and 50,000 in Multan. But such a distribution would be possible only if there were a well-developed network of railways along the right bank of the Indus, which would permit a rapid concentration of the reserves with the troops of the first line, and the moving of great masses from one point to another. Under present conditions a considerable time will be required to bring up reinforcements, and therefore the troops of the first line must be stronger, in order to be more independent, and to be able to defend their posts till the arrival of the reserves.

The concentration of an army of 160,000 on the line Kandahar-Kelat and Ghilzai and 60,000 on the line Ghazni-Kabul will not show the English which line we have selected for our operations. We may advance

with both flanks, whilst making a demonstration in the centre, or we may advance the right wing and the centre, with a false attack by the left wing. Also the attention of the English will be directed on the north, whence our Chitral and Gilgit columns, strengthened by bands of the insurgent tribes, will be taking up a position which will threaten the communications of Peshawar with Lahore.

We may consider the following the most expedient, and hence the most probable distribution of the English forces:—50,000 in the Pishin entrenched camp, 50,000 in the square Sherauni-Zarmelan-Gomul-Bannu, 30,000 at Jelalabad, 10,000 in the Kurum Valley (guarding the passes), and 10,000 on the north front; in reserve, at the railway junctions—20,000 at Dera-Ghazi-Khan, 20,000 at Kundian, and 40,000 in a general reserve at Lahore (in the distribution of the Russian troops for the advance, and the English troops for the defence, for simplification we do not take into consideration troops used for protecting lines of communications; the slight difference between the numbers mentioned and the actual figures will be in favour of that side to which the native population adheres). Such a distribution will allow the English under any circumstances to oppose to our advance the greatest possible force, no matter what line of operations we might select, as is clear from the following:—

The English army, 50,000 strong, with the Pishin entrenchments as its pivot, will show serious resistance, and will be well able to carry out independent operations against the rear and flanks of our army, if the latter prefers to march round Pishin. Then as our troops advance, *viâ* Pishin, towards Dera-Ghazi-Khan, the English army from Pishin, retiring in the same direction, can be reinforced by 20,000 from Dera-Ghazi-Khan, 40,000 from Lahore, and if it is necessary, by the reserve of the northern section of the defence, *i.e.*, by the 20,000 from Kundian; which will make up a force of 110,000 to 130,000 to oppose the 120,000 to 140,000[1] of our army.

On the advance of the Russian army to Gomul, along the valley of the Zkhob River, the English army from Pishin, retiring to the same place, might be reinforced by the 50,000 at Gomul, 40,000 from Dera-Ghazi-Khan and Kundian, and 40,000 from Lahore, *i.e.*, up to 180,000 strong as against the 120,000 to 140,000 of our troops from Pishin, and 30,000 to 40,000 from Ghazni.

If the very worst possible happen for the English, *i.e.*, when their Pishin army is forced southwards from our line of operations towards Dera-Ghazi-Khan, the 120,000 Russians will meet, at the passes of the Eastern Suleiman, 20,000 from Dera-Ghazi-Khan, 40,000 from Lahore, and 20,000 from Kundian, or upwards of 80,000 men, who ought to arrest the progress of the Russian army till the English troops from Pishin came up.

If our army advances along the valley of the Zkhob River towards Gomul, and taking into consideration a similar retirement of the English

[1] 20,000 from the corps left by us in Pishin, if no serious attempt by the English to advance from the south against our rear and right flank.

army at Pishin southwards, we shall meet the 50,000 English at Gomul, 20,000 from Kundian, 20,000 from Dera-Ghazi-Khan, and 40,000 from Lahore—that is 130,000 in all—who ought to hold up our advance till the arrival of the English force from Pishin.

If the Kabul army advance towards Peshawar, 30,000 English will meet it at Jelalabad, and they can be reinforced by 20,000 from Kundian.

Thus we see that it does not matter in what direction our blow is aimed, but it will be met everywhere by, approximately, forces of the same strength as ours.

From the above calculation of the concentration of the English forces we see that the most favourable position for them is a retirement towards the central fortified camp in the valley of the River Gomul. Here they will concentrate 180,000 strong, and using the fortified camp as a pivot—and in the camp, in all probability, will be very large stores of provisions—they will be between our two armies, holding a central position between them, and at the same time flanking all the other routes across the Eastern Suleiman to the Indus.

Having thus become acquainted with the position of our army at the moment of departure, and also with the probable distribution of the enemy's troops, we may now sketch out a general plan for the third campaign, *i.e.*, for the advance to the Indus itself.

The Pishin fortified position is exceedingly strong from the front, consequently a frontal attack on it would entail great losses; therefore, it becomes necessary to combine the frontal attack with a movement to turn the position from the rear. From a strategical point of view it would be most favourable to turn the Pishin position from the north, which would allow us, if successful, to hurl back the defending troops to the south of our routes of operation towards the Indus, which, in conjunction with the destroying of the Sind-Pishin railway, would place the Pishin army for some considerable time in an isolated position, and thus weaken the forces of the English in another part of the theatre of war by 50,000 men.

In the above valuation of the routes, leading from Pishin to the passes of the Suleiman, it appeared that we ought to select for our advance to the Indus the two routes along the valleys of the Rivers Borai and Thal-Chotiali towards Dera-Ghazi-Khan; but if the whole Anglo-Indian Army, or a part of it, is concentrated on the valley of the Gomul River, it would be risky to select Dera-Ghazi-Khan as the direction for us to operate in.

To explain what I have said, let me point out two possible contingencies which might occur if our army moved in the latter direction: either the whole Anglo-Indian Army will concentrate in the square Zarmelan-Shirani-Gomul-Tochi, or in this square will be only the 50,000 men of the Gomul army, reinforced by 20,000 from Kundian, whilst the rest of the enemy's forces will directly block the approach to the Indus Valley. In the first case, it would be out of the question to move towards the Indus, while we had on our flank and in our rear 180,000 English, who could easily occupy the passes over the Eastern Suleiman, over which our army was descending into the Indus Valley. There would be no

danger for the Anglo-Indian Army in being cut off in its turn from the Indus, as in the above-mentioned fortified camp in the valley of the River Gomul there would be collected, in all probability, very considerable supplies; also, the Gomul army can alter its line of communications *viâ* Peshawar; and, finally, this army will be so strong that it can measure its strength with our army, and open for itself, when circumstances demand it, communications with India.

In the second supposed case, *i.e.*, when our army has descended the mountains to Dera-Ghazi-Khan, has changed front towards the north, and is moving along the Valley of the Indus towards Dera-Ismail-Khan, with the Anglo-Indian 110,000 strong in front of it, then the Gomul army, 70,000 strong, moving southwards and seizing the passes over the Eastern Suleiman leading into the Valley of the Indus, could completely cut our army off from its base.

The Gomul army could hardly be hindered in doing this by the divided action of our two corps—the Pishin and the Kabul—each about 30,000 strong, especially as the Gomul army will have a central position, which will give it all the advantages of action on an inner line of operations, viz., the possibility of beating each of our corps separately. From the above we see that we should refuse to advance along the Borai and Thal-Chotiali roads to Dera-Ghazi-Khan, in order to cross and descend from the mountains opposite the last-mentioned place, front northwards, and move along the rear of the Anglo-Indian troops holding the passes of the Eastern Suleiman. Either way, we must decide on a direction for our operations leading into the valley of the River Gomul, and our army, 120,000, can move into the latter valley by the roads:—

1. Along the valley of the Zkhob River.
2. Along the valleys of the Zkhob and Borai.
3. Along the valleys of the Borai and the Thal-Chotiali to the Eastern Suleiman, and then, by degrees, seizing and fortifying the passes over the latter, in order to protect our line of communications, our army can move northwards into the valley of the Zkhob and Gomul Rivers.

The movement of the Kandahar army into the valley of the Gomul River can be supported, firstly, by the Kabul army (30,000 to 40,000 strong) from Ghazni along the road into the Zkhob Valley *viâ* Shagtori and Wanu, and, secondly, by part of the forces of the Pishin corps. The Kabul army, concentrated along the line Ghazni-Kabul (130 versts), and occupying all the exits eastwards towards Peshawar, will put the English into a position of doubt as to which line of operations will be selected for our advance; also the indicated position of the Kabul army will allow it to leave 20,000 at Kabul and in the passes to face the English at Peshawar, and with 30,000 to 40,000 to hurry from Ghazni against the right English flank in the Gomul Valley.

Forbidding, as being risky, independent action by the Kabul army against the force at Gomul, we must acknowledge that joint action by our two, Kabul and Kandahar, armies would be exceedingly useful. As a

connecting link between the two portions of the Kabul army (*i.e.*, between those left in Kabul and those intended to move into the Gomul Valley), we can utilise the force of 10,000 men stationed in Ghazni, whose duty will be to strengthen, as circumstances require, those or other forces.

When our troops are concentrated in the square Zarmelan-Sherauni-Gomul-Baunu, their lines of communications will be to Kandahar *viâ* Maruf and to Kabul *viâ* Baunu, Shagtori, and Ghazni.

It will be absolutely necessary to occupy all the passes across the Eastern Suleiman to the Kuram River inclusive; by occupying them and forcing the English back beyond them we shall have a great advantage over the latter. In fact we, being hidden from the view of the English by the Suleiman range, can threaten them all along the line, and after forcing them, in consequence of this, to scatter their forces, we shall dash with superior numbers on one or two particular points. After breaking through the English defensive line, which is guarding the exits from the Suleiman, we must move rapidly to the Indus, to seize the crossing places and to bar their line of retreat to the English. This period of the struggle will in all probability be short, as once their line of defence of the exits from the mountains is broken through it will be risky for the English troops to stay there any longer, and they will quickly retreat into the Indus Valley, where they will again show resistance to cover the crossing of their troops to the left bank of the river.

After the retreat of the English on to the left bank of the Indus, all the territory on its right bank will pass into our hands. The River Indus will be a vast impediment in the way of our farther advance eastwards; but a river cannot be considered an impassable obstacle. This is what Napoleon says about rivers as lines of defence (a letter from Napoleon to Eugène):—

"A river was always considered an obstacle which could hold one back only for a few days, and one could not hinder except by placing forces at the bridgeheads along the opposite bank, and these forces must be ready to take the offensive as soon as the enemy commences to cross. But if one wishes to content oneself with a defence, then there is nothing to be done but to dispose one's forces so as to be able to concentrate them, and fall on the enemy before he has finished crossing. . . . . Nothing can be more dangerous than trying to defend a river on the opposite bank; once the enemy has begun to cross—and he will always undertake it — he will find the army in a defensive, and exceedingly extended, position, and will always hinder its concentration."

Thus, if we cannot consider the Indus as an obstacle which could stop the further advance of our troops, at all events crossing this river is a very difficult operation. Besides, the English, as they will have in their rear a fertile and industrial land, as also railways, will have no want of provisions and war material; whereas we shall have to bring up everything from a great distance from the Caspian (2,000 versts to the Indus), as the supplies of the poor country, exhausted also by the previous campaign, will not be able to supply the needs of an army 230,000 strong. However, on the other hand, Russia will have moral advantages. The

English troops will be disheartened by the fact that the enemy has managed to overcome so many obstacles and come up to the Indus itself; in their rear, in all probability, mutiny will break out, and dissatisfaction and disorder will appear even in their troops; the Russians, however, will be full of faith in their forces, and a recognition of the feats they have accomplished will inspire them and compel them to make every exertion to guarantee the reward for the labours they have undergone by one decisive victory.

CHAPTER XIX.

The Fourth Campaign.—From the Indus Eastwards.

In consequence of the difficulty of trying to form, even approximately, any conception of the course of this campaign, as the greater part of it will be the result of events which will have already occurred, we will limit ourselves to a more careful description of the theatre of war of the fourth campaign, and will indicate the lines of operations from the Indus to Lahore and Delhi, making a comparative appreciation of them on the basis of unchangeable *data*. South of the Himalaya, between the foot of the Suleiman mountains on the west and the mountains of Indo-China on the east, lies a vast plain, watered by river systems, which collect the water of the Himalayan ranges; the surface of this plain, which is called the Indo-Ganges plain, is nearly horizontal. The part of the plain, which will be the arena of the fourth campaign, is cut up by the beds of rivers, the most important of which, counting from west to east, are the Indus, Jhelum, Chenab, Ravi, Bias, Sutlej, and the Jumna.

The Indus is the most westerly river of the Punjab, and also in respect of volume of water is the main artery of the district. In our description of the theatre of war we made the acquaintance of this river as a strong barrier to the invasion of India. The strength of this obstacle is due to the fact that it is hard to cross by bridges. On that part of the river to Kalabagh the main hindrance to a crossing is the rapid current and the sudden rises of the river; and from Kalabagh downwards, the swampiness of the low-lying banks, and the great width of the bed of the river, which is constantly changing owing to a flush coming down; we must also add that the Indus has no fords. As an example of the difficulty of getting across this river we may quote the construction of the bridges, in the Afghan War of 1839-40, between Sukkur and Rori, which took 16 days, although both banks were in the possession of the English, and they had the unlimited resources of India at their disposal.

According to English opinion (Lord Chelmsford), the best part of the river for crossing is Dera-Ismail-Khan-Kalabagh, and the most suitable time that when the water is lowest, *i.e.*, between October and March.

The five tributaries of the Indus in the Punjab, the Jhelum, Chenab, Ravi, Bias, and the Sutlej, flow eastwards, and, as regards volume of water and breadth of channel, stand considerably lower than the main river;

the Jhelum, Chenab, and Sutlej have the most water. High water is at the same time, both as regards the Indus and its tributaries, whose inundations are but little less extensive than those of the main stream (Indus). The right banks of the Punjab rivers command the left; this is especially the case as regards the Jhelum in that part where it leaves the base of the salt range.

Steamers do not go on the Sutlej beyond Ferozepur, or along the Jhelum beyond Pin-Dadan-Khan; a regular steamer service only exists as far as Multan. Although the Punjab rivers do not, speaking generally, lend themselves to navigation, there are on them some 5,000 to 6,000 light river ships, which have, in ascending the streams against the current, the advantage of the south wind, which is in the ascendency from April to September. Ferries form a great part of the methods of getting across the Punjab rivers; bridges of boats have but a temporary character, as they have to be broken up at high water. There are permanent railway bridges across the Jhelum at Jhelum and Malakval, across the Chenab at Wazirabad, across the Ravi at Lahore, across the Trimab at Sher-Shah, across the Bias at the station of Bias, across the Sutlej at Phillur, Ferozepur, and Adamwagan, near Bahawulpur. (*Vide* Tiezenhausen's "Sketch of the British Monarchy.")

The nature of the various parts of the Punjab is varied. The land between the Indus and the Jhelum, or the Sind-Sagar-Doab, consists of sandy deserts, covered in places with moving sandhills, which are blown about by the wind. The land between the following rivers—the Chaj-Doab, between the Jhelum and the Chenab, the Rechna-Doab, between the Chenab and the Ravi, and the Bari-Doab, between the Ravi and the Bias-Sutlej—consists of expanses of steppe, called bars, and serve as pastures. The northern part of the Bari-Doab, between the Rivers Bias and Sutlej, or the Jullunder-Doab, and, finally, the district of Sirhind, which is bounded on one side by the Himalaya, and, on the other, by the Desert of Rajputana, owing to their natural fertility are but little less fertile than the best districts of Hindostan. (See Tiezenhausen's "Sketch of the British Monarchy.")

South of the Sutlej, between the Indus and Sirhind, is a vast unwatered expanse, called the Desert of Rajputana, or Thar, across which the transport of troops is connected with great difficulties. The only convenient route for getting from the Punjab into the Valley of the Ganges is the Sirhind, at the foot of the mountains, which stretches in a narrow strip along the foot of the Himalaya, and leads into the valleys of the Jumna and Ganges, and is the centre point of Hindostan.

We have already spoken of the railways of the Punjab. Lahore is the junction of all the railways and trunk roads which unite the Punjab with the Ganges Valley. All the most important points in the Punjab are united by good roads. From Peshawar to Delhi, *viâ* Sialkot and Amritsar, runs the grand trunk road, which, for almost all its length, runs alongside the railroad which unites these two places.

From Dera-Ghazi-Khan is a road to Multan, thence along the left bank of the Ravi, across the fertile part of the Bari Doab, to Lahore. Regarding the Jullunder Doab and Sirhind, they are cut up by a thick network of roads, thanks to which the movement and manœuvring of an army towards Delhi and the Jumna would not be very difficult. Along the left banks of all the rivers of the Punjab are also roads, which are necessary to defend the crossing places.

As regards fortifications, beyond the entrenched camp at Rawal Pindi and a few bridgeheads, there are none in that part of the theatre of war which we are at present considering.

Having thus become acquainted, in general terms, with the theatre on which the fourth campaign will be fought out, let us proceed to a comparative valuation of the various lines of operations from the Indus to Delhi, which latter point we have acknowledged to be the last in our invasion of India. Taking no notice of the lines of operations from the lower Indus across the Desert of Rajputana direct to Delhi, which are worthless for moving large bodies of troops, let us consider those which start from the Indus and pass to the north of the Rajputana Desert *viâ* Sirhind, *i.e.*, those which go to Lahore, which is the meeting-place of the roads from the Punjab to the Ganges Valley.

The following is a list of the chief roads :—

1. From Attock or Kushalgarh *viâ* Rawal Pindi, Jhelum, Gujerat, and Lahore—alongside the railway (about 340 versts).
2. From Kundian *viâ* Shahpur, Gujerat, and Lahore—alongside the railway (390 versts).
3. From Kundian *viâ* Shahpur, Pindi (Bhattian), Shekupura, and Lahore (280 versts).
4. From Dera-Ghazi-Khan *viâ* Muzaffargarh, Multan, Montgomery, and Lahore—along the railway, across the fertile portion of the Bari Doab (400 versts).
5. From Dera-Ghazi-Khan *viâ* Muzaffargarh and Multan into the valley of the Sutlej, and thence to Lahore by the right bank of the river (480 versts).
6. From Rori *viâ* Bahawulpur, Multan, and then by the fourth route (770 versts).
7. From Rori to Bahawulpur and thence along the left bank of the Sutlej to Ferozepur (680 versts).

Of all these routes, we must give the preference to Nos. 4, 5, and 6, which start from Dera-Ghazi-Khan and Rori, and thence to Lahore and Ferozepur, for the following reasons :—

1. By moving along these routes one avoids, with a single exception, all the rivers of the Punjab, which are strong lines of defence ; also it obviates the necessity of crossing the wide belt of desert, Sind Sagar Doab.
2. Our right flank will be protected by the Rajputana desert, and our left by the Ravi.

3. If necessary we could move by two routes, along the left bank of the Ravi, and the right bank of the Sutlej.
4. The roads we are discussing are closer to the Sind-Pishin Railway, which, at the commencement of our movement beyond the Indus, will in all probability be put in a state for us to be able to utilise it. Thus the bringing up of provisions to the Army, moving along the three indicated routes to Lahore, could at first be managed by the Sind-Pishin Railway, and then by the Indus, Trimab (the joint channel of the Jhelum, Chenab, and Ravi), and the Sutlej. If it were also managed to quickly restore, so as to be able to utilise it, the line from Rori to Multan, then the afore-mentioned routes would satisfy all necessary conditions for the advance along them of a large army. The most convenient of them is the route along the left bank of the Ravi, running through the fertile part of the Bari Doab.

The seventh route as far as Ferozepur, and also part of the sixth from Rori to Bahawulpur, which possess all the advantages we have just enumerated, present, according to the words of Major David of the Indian Army, a great obstacle to an advance, in consequence of the scarcity of water along them and the bad effects produced by the climate of the valley of the Lower Indus; thus he says: "Doubtless there are but few places in India so fatal to the constitution of Europeans as Upper Sindia, and a European army cannot, without risk of heavy loss from sickness, stay here later than March." ("Is a Russian invasion of India feasible?" by Major David, Indian Army.)

Having made a comparative valuation of the probable lines of advance from the Indus to Lahore and Ferozepur, and having given the preference to the southern routes, we must say that, in spite of all this, circumstances might compel us to choose the northern routes.

Thus, let us suppose that the third campaign brought our army to that part of the Indus which is north of Ismail-Khan, and we had just scored a great success against the English, hurled them over on to the left bank of the Indus, and obtained possession of the crossings over the river; let us suppose that this success of ours started fermentation among the native population, which broke out into a regular rising in rear of the English; it is clear that, after arranging about provisions, we should immediately move eastwards and from those places where our troops were actually then at.

The possibility might be suggested to me of a movement by our troops simultaneously by two routes to Lahore, as, for example, from Attock and Dera-Ghazi-Khan. But such a forward movement would demand a very considerable number of troops, and would compel us to make each army absolutely independent, so as not to subject them to be beaten in detail by the English army, which can operate along inner lines, as the local conditions of the theatre of war are in favour of the English.

But we cannot send a large force across the Indus, as it will be necessary to leave a large army as a garrison on the right bank of the river to guard the whole of our rear.

What forces we shall move into the heart of India it is hard to say; everything will depend on the circumstances of the minute, *i.e.*, the numbers of the Anglo-Indian Army, its qualities in this campaign, the position the native population of India takes, and also on the number of troops we have to tell off to guard our rear in Afghanistan.

CHAPTER XX.

INFERENCES.

In our investigation we have pointed out the great efforts which Russia must make to carry out a campaign to India and further East. But now arises the question as to what benefits an invasion of India can bring the Russian nation.

The result of our victories over the English might be the formation either of a Russo-Indian monarchy, or of a league of kingdoms under the protection of Russia, or, finally, the preservation of the English rule under condition of a close alliance between Russia and Great Britain.

Let us suppose we create a Russo-Indian monarchy; the main difficulty is the enormous extent of the Empire. The new monarchy will be at a vast distance from the central seat of Government, the result of which will be the necessity of giving too great powers to the governor of the country, which again may become the subject of misunderstandings. To govern the land, without officials who know the country and the local languages thoroughly, is a tremendous difficulty. Besides that, in order to keep peace in the country, it will be necessary to have in it very considerable armed forces, which we should have to constantly increase, as with the development of the Indian races will appear a striving for freedom. It is true that the commercial advantages which India would give might cover the expenses of the government of the land. The railway system, made by Russia, would become the international route between Europe and the East; the commerce and trade of Russia would receive a gigantic forward impulse. All this might happen, but for this we must have very great perseverance in our internal *régime*.

The formation of a series of independent kingdoms will give no advantage to Russia, because the commercial relations which might be woven between us, and these kingdoms would suffer from constant wars between them; perhaps ending with the formation of one mighty Mahommedan kingdom, which will gravitate towards Afghanistan, and be inclined to be in alliance with it, as was the case in the days of Baber and Shir-Shah, though on this occasion the conquering movement will start, not from Kabul, but from India, where there is a Mahommedan population of 57,500,000 souls. We may fear a revival of the old warlike spirit among the latter, the outcome of which would be the proclamation of a Yihad against the unbelievers, as was the case in the days of the first Caliphs. Thus the foundation of a powerful Mussalman kingdom is opposed to our interests, as it may complicate Russia's affairs in Central Asia. Again, the Indian kingdoms if left to themselves might revert to the hands of the English.

A league of Indian monarchies under the protection of Russia would give our Government much trouble, and would be so strong a power, that we should have to take it into our calculations; also this league would not prevent a sufficient guarantee against a fresh invasion by various European nations.

Having thus glanced at the various results which may take place if we conquer India, the following seems to me the most advantageous plan. We should establish a protectorate over Afghanistan, either with or without occupying it, reserving for ourselves the whole of Afghan Turkistan, which will give us a natural southern boundary, and taking the whole of the country enclosed by the following boundaries: On the west by the Persian frontier, on the north by our present frontier, viz., the Hissar chain and a line to be agreed upon between Kilat-i-Ghilzai and Dera-Ismail-Khan, on the east by the Indus, and on the south by the sea. Through this territory will run a railway from the Caspian Sea *viâ* Herat, Kandahar, Jacobabad, and Rori to Karachi; we have already spoken of the commercial advantages to be derived from occupying this territory. When we have conquered the whole of this territory straight down to the Indus, we can prepare on the latter a sally-point for an invasion of India; we should thus have in our hands a veritable sword of Damocles, by means of which we could paralyse any harm which England might wish to do us in Europe; besides which, our positions on the Indus would compel the English to strengthen their forces in India, to increase the taxes, and to be in constant fear for their possessions in Hindostan. In all probability, this would lead to the policy that we desire, namely, the conclusion of a close alliance between Russia and Great Britain, which will be very advantageous for both kingdoms. It is favourable to England, inasmuch as it will relieve them of the fear of losing India; the population of the latter will have to put up with their fate, as they will not look on the Russians as their deliverers, when once the latter have become the allies of the English.

The alliance will be useful to Russia, because, with the aid of England, the strongest naval Power, Russia's position in Europe will be strengthened, and the Eastern question can be decided in her favour. Again, we shall have as our neighbours in India, not Mahommedan fanatics or enervated Indians, but the English, the leading nation of the world.

In all probability we should not invade the heart of India, as England would not consent to stake her cherished India, but would agree to all the conditions we offer her from the banks of the Indus.

Journal R.U.S. Institution
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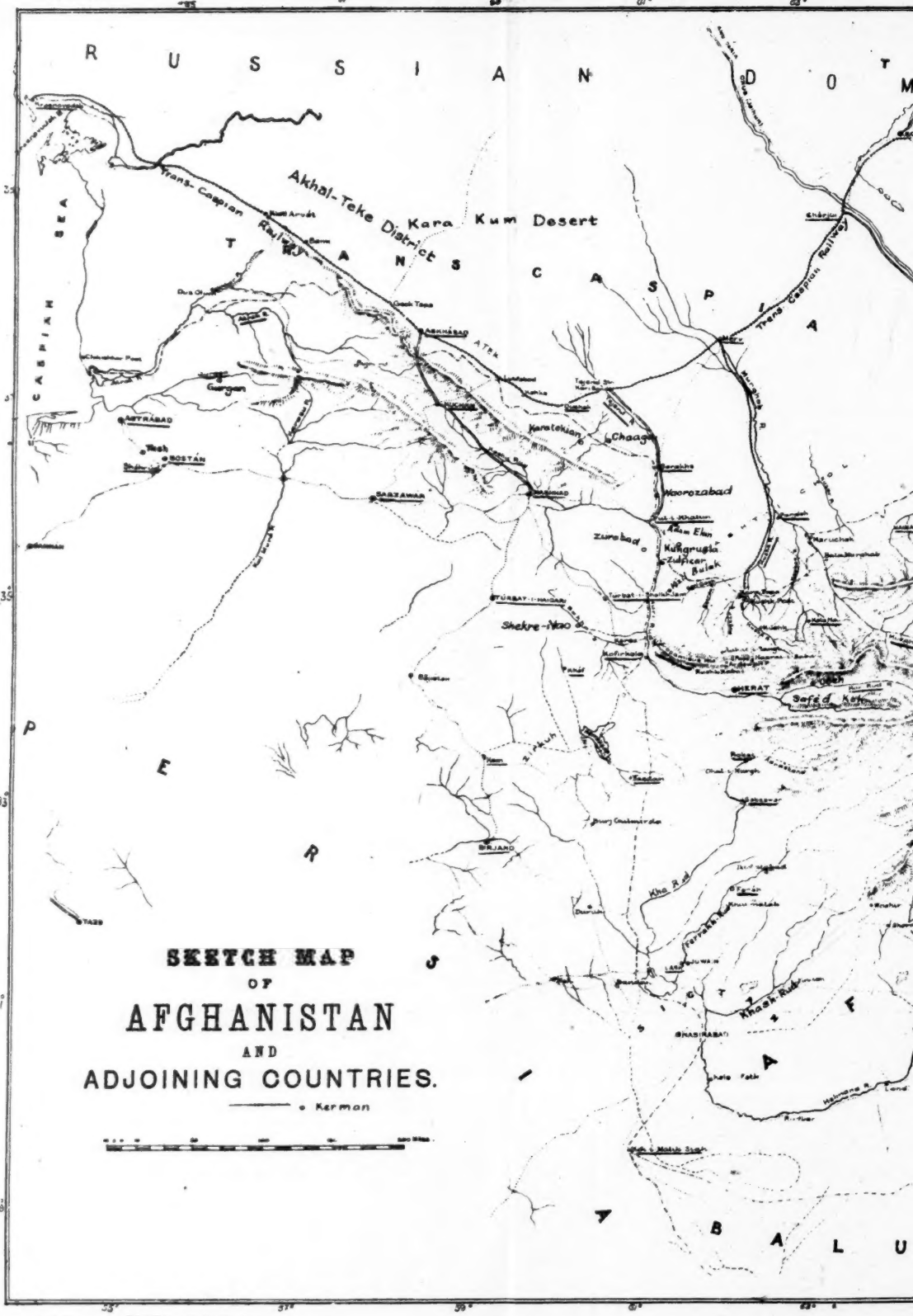

SKETCH MAP
OF
AFGHANISTAN
AND
ADJOINING COUNTRIES.

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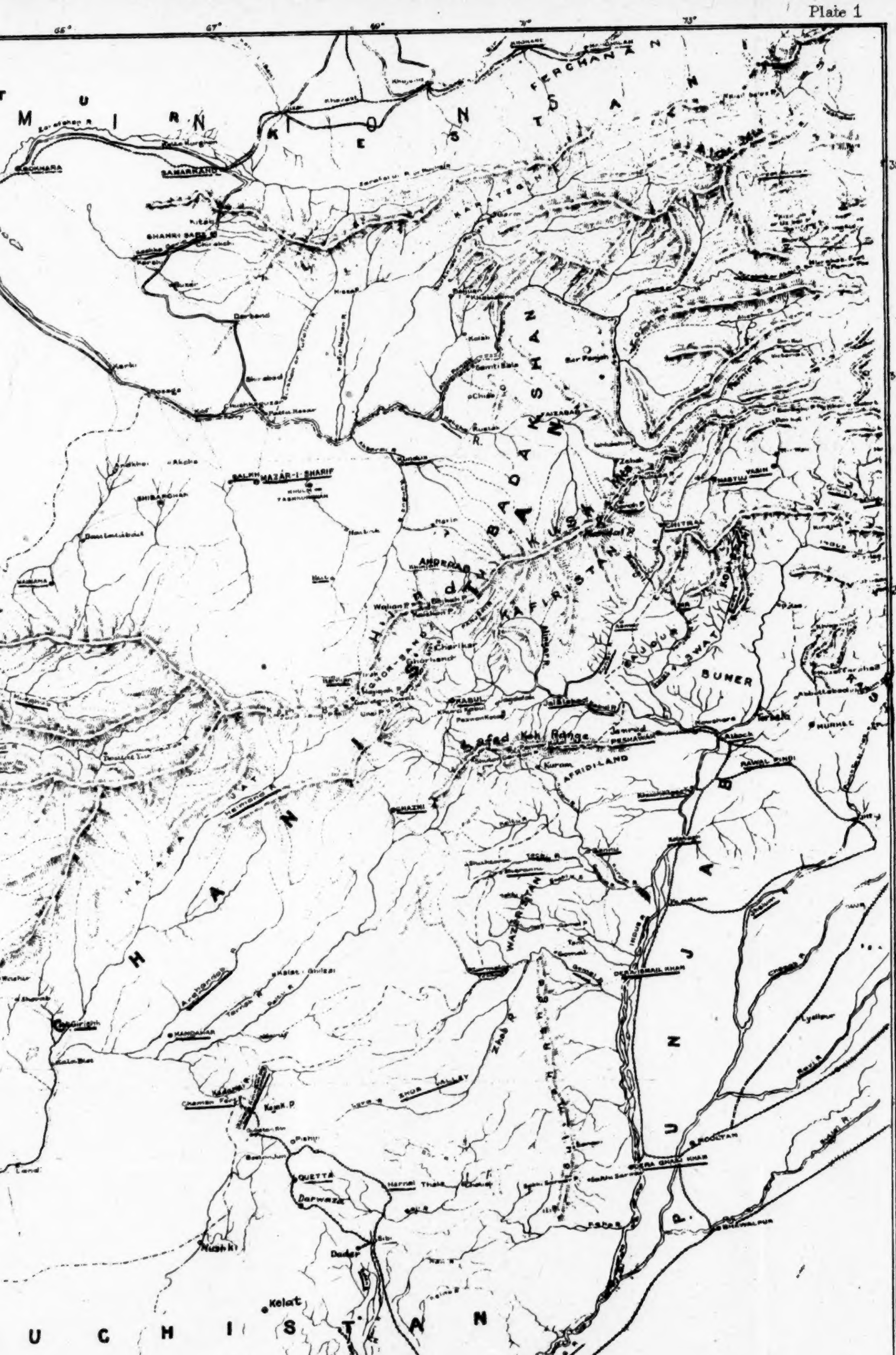
Plate 1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RAWAL PINDI
WAZIRISTAN
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KANDAHAR
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Kojak P.
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Darwaza
Dadar
Nushki
Kelat
MOOLTAN
DERA GHAZI KHAN
PUNJAB
BALUCHISTAN

INFORMATION RELATING TO THE CHINESE EMPIRE.

From the Russian of Lieutenant Z. MATUSOVSKI.

Translated by Lieut.-Colonel W. E. GOWAN, Retired List, Bengal.

(*Continued from March Journal, page 280, and concluded.*)

POPULATION OF THE CHINESE EMPIRE.

With regard to the density of the population of the "Middle Kingdom," there exist, even at the present time, diverse opinions amongst European writers, many of whom look distrustfully at the high figures which Chinese sources of information usually afford. And yet persons who are intimately acquainted with China maintain the conviction that the most trustworthy sources of information can only be compiled from Chinese official documents, since such are based on the returns of the number of people, and are periodically prepared under the control of Government officials.

On the basis of such returns, then, the population of the entire Chinese Empire is computed at more than 398,000,000 souls,[1] and although these figures appear at the first glance to be very high, still they cannot but be admitted as likely to be correct, if we take into consideration the percentage of the increase of population, the vast extent of the Chinese Empire, and the conditions of the climate and soil of China as a whole, in connection with the many peculiarities in the life of the people. At such a conclusion have arrived all the best known Chinese scholars, who have been engaged in the study of the question from every point of view, such, for instance, as the Russian Professors Zakharoff and Vasilieff, and the American *Savant* Dr. Williams, and others. The last-named authority, in adducing various particulars relating to the density of the population of Inner China and in indicating, amongst other things, the peculiar fertility of the soil of China, which yields in most parts of the country two, and in especially fertile localities three crops[2] every year, comes to the conclusion that the

[1] This is said to be the population of the 18 provinces of Inner China, but later information reduces these figures to 381,500,000 souls.

[2] Or an inexhaustible supply of nourishing *succedaneum* and of all kinds of vegetables.

physical conditions of the country cannot merely easily support such a colossal population, but actually favour its substantial increase.[1] Meanwhile, it should be observed that the Chinese are, as is generally known, a very abstemious people, and not at all fastidious with regard to the quality of their food supply.

In addition to this, there exist also other facts which go to testify to the unusual density of the population of Inner China. Thus, notwithstanding a certain traditional attachment, on the part of the Chinese, to their native land and to the complete absence of anything like an alien inflow of people from other countries, the native inhabitants have had, nevertheless, because of the insufficiency of arable land in their own country, to leave China proper and go to other countries, wherein, at the present time, the Chinese population is already to be counted by millions. For instance, the tide of Chinese emigration has already set towards the Kingdom of Siam, the islands of the Indian Archipelago, Cochin-China, California, Australia, the Philippine and Sandwich Islands, as well as to the western littoral of Central and Southern America, and, in a lesser degree, towards British India. Of late, too, an emigration movement from Inner China has taken an overland direction, viz., towards Manchuria, Chungaria, and Tibet. In addition, too, to the land population of the Chinese Empire, an immense number of the inhabitants of Inner China are compelled to constantly live in boats, and in these they are born, are brought up, and in these they die—in a word, they pass almost the whole of their lives in boats on the various rivers. In fact, floating habitations in immense numbers cover the surface of the rivers and coast lines of the "Middle Kingdom," and these contain millions of inhabitants,[2] who find for themselves in such abodes all that they require for their subsistence, in the shape of vegetables, fish, poultry, etc., etc.

With regard to the natural increase in the population of the Chinese Empire, notwithstanding the existing considerable mortality in this country (in consequence of extremely bad sanitary and other unfavourable conditions), it may be said to steadily mount up—at least in those years that are free from those popular calamities which are usually attended by the loss of millions of people. It is known that the Chinese, according to the custom of their progenitors, are always busying themselves about the early marriage of their children. Moreover, their popular habits, traditions, and the teachings of their sages and others all unite in strongly urging upon them the duties of domestic life and the multiplication of posterity. Consequently the percentage of unmarried persons in China is very low, whilst a childless union is held to be a family misfortune.

In the subjoined table are given the totals of the population of Inner China at various periods of time. These figures have been prepared by most competent persons from Chinese official sources of information :—

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[1] "The Middle Kingdom," by Dr. W. S. Williams.

[2] In the town of Canton alone and of its suburbs it is computed that there are not less than 300,000 souls living on board boats of all sizes.

Year to which the figures relate.	In the Reign of each particular Emperor.	Total Population.	Sources whence the Information has been derived.
1792	Tsian-Loon	307,467,200[1]	General statistics in Dr. Morrison's "Anglo-Chinese Colonial Report of 1829."
1812	Tszia-Tsin	362,447,183	Official Census Returns. "The Middle Kingdom," by Dr. W. S. Williams.
1842	Dao-Hooan	413,008,450	Calculations of Professor Zakharoff from *data* for the year 1812. Returns also of the Financial Department for 1841-42.
1868	Toon-Chi	404,946,514	Calculations of Professor Vasilieff compiled from Official Chinese Documents.
1881	Hooan-Sooi	380,000,000	Information inserted in the "Almanach de Gotha" for 1882, taken from Chinese Customs Returns.
1882	Hooan-Sooi	381,688,670	Information compiled from Official Chinese Returns for 1879 and 1882, by Mr. Popoff, Senior Dragoman of the Russian Diplomatic Mission to Pekin.

From the above table it is apparent that the population of Inner China, during the forty years between 1842 and 1882, has not only not increased, but that, on the contrary, it has actually decreased by more than 31,000,000. Such a considerable falling off of population is, however, to be explained by the occurrence of popular calamities, and by the outbreak of civil war in Inner China during the whole of the period in question. Thus, the Tai-Pin insurrection, which raged from 1850 to 1864 throughout the whole of South-Eastern China, terminated in the utter desolation of thirteen of the richest provinces of the country, and during that time, according to the reports of Chinese officials, the population was, in places, reduced eight per cent. Almost at the same time as the Tai-Pin insurrection there occurred the Muhammadan rebellion in the province of Yun-Nan, whence the Chinese were driven out by the rebels, and wherein they were not able to restore their rule until the year 1872. Then, again, the outbreak of the Dungans, another Mussulman outburst, which occurred in 1862 in the provinces of Shen-Si and Han-Su, and which, after rapidly embracing the whole of Western China, lasted for the space of nearly fifteen years, and completely devastated the country. In this rebellion the greater part of the inhabitants of Western China perished. Finally, the terrible famine, which from 1876 to 1878 overtook Northern China, was attended by enormous mortality in the provinces of Shan-Si, Shen-Si, Chi-Li, and He-Nan. All these calamities, coupled with the emigration of the Chinese population, which was going on at a

[1] According to Dr. Macartney, the population of China for the year in question was reckoned at 333,000,000 souls.—"Chinese Repository," Vol. I., p. 359.

specially high rate during the same period, have been ample cause for the very noticeable reduction in the total population of Inner China.

With regard to the returns of the population of those other countries, which enter into the composition of the Chinese Empire, it should be observed that almost all the information on this subject is extremely contradictory, and is based more upon various suppositions than upon positive facts. Thus, in the case of Manchuria, one source puts it at 12,000,000 and another at from 3,000,000 to 4,000,000. The first of these sets of figures has, however, been taken by several modern geographers as something approximating to the truth. But it is known from the Chinese official returns for the year 1882, that the number of inhabitants in the most densely populated province of Manchuria, viz., Shen-Tszin, barely amounted to 4,243,260 souls. Whilst the other provinces of Manchuria, especially the northern one, in spite of the considerable immigration which has of late set in in this direction from Inner China, have still only a very sparse population. For this reason certain competent European residents in China have very good grounds for their belief that the actual total of the population of Manchuria does not now exceed 9,000,000 souls.

In Mongolia, which, in an ethnographical sense, embraces Khalkha, Chungaria, Kuku-Nor, Ordos, and Inner Mongolia—excepting the Chinese colonies and groups of Muhammadan peoples scattered about those countries—Père Hyacinth thinks that there are 3,000,000 souls, but Dr. Williams and Dr. Courcey, and also our famous traveller Timkovski, do not consider that the population of this province exceeds 2,000,000. The first of these sets of figures cannot, however, but be the more accurate, since they are taken from the returns of the male population liable to the calls of military service.

In Eastern Turkistan and in the country situated in the basin of the Tarim River, the number of inhabitants, according to the information obtained by the most recent European travellers, may be put down approximately at from 700,000 to 800,000 souls.

Still less trustworthy than that concerning the above countries is the information which is to be had relating to the total population of Tibet. As is generally known, there lived during the past century, in Tibet, an Italian missionary of the name of Oratsio della Penna, and he put the population of Tibet down at 33,000,000. In pointing out that these figures were very high, Klaproth expressed the opinion that the population of the country in question could not exceed 5,000,000, and other modern geographers usually accept figures under this head which vary from $3\frac{1}{2}$ to 11 millions.

Taking the same sources of information, Beam and Wagner fix upon 6,000,000 as the right mean between the figures above quoted.[1]

Meanwhile, we know, from the accounts of the most recent European travellers, that the greater part of Tibetan territory is very sparsely populated. Thus the vast area, which lies to the north-west of that

[1] Elisée Réclus, *Géographie Universelle*, tome vii., p. 68.

country, and which is known under the name of Khachi, is an almost uninhabited desert waste. To the west, too, and along the highlands of the Rivers Indus, Sutlej, and Yaru-Tszanbo, which here flow over tablelands rising to a great absolute height, the inhabitants of the country are grouped in but a few localities. In like manner the eastern portion of Tibet can be but comparatively thinly populated because here there are mountain ranges covered with dense forests. Moreover, the mountain masses, being closely packed together, here form confined and almost inaccessible gorges. The more densely populated portions of Tibet therefore, must be the two central provinces of Ooi and Tszan, and in these are situated the principal towns of Tibet, of which Lhassa, with the largest population, does not contain, according to the calculations of European travellers, more than 24,000 inhabitants, exclusive of Lamas. Consequently the entire population of Tibet proper, without Kuku-Nor, which constitutes a separate province, cannot exceed 2 or 2½ million souls.[1]

Chinese Ports Open to Foreign Trade.—Statistics of the Foreign Trade of China.

The commencement of European trade relations with China, by sea, dates from the sixteenth century, when, in the year 1516, the first Portuguese vessel arrived at Canton. In 1522 the Portuguese opened a trade with the town of Nin-Bo[2] and in 1557 they obtained permission from the Chinese to establish a factory in the peninsula of Macao but, after endeavouring to extend their trade relations to Amoy, they were speedily driven out. Soon after the Portuguese had appeared in China the first Dutch vessel came to Macao. This was in 1622. The Dutch first of all settled themselves in the Pescadore Islands, and in 1624 they crossed over to the Island of Formosa where, after a lapse of four years, they built the fort of Zealand in the neighbourhood of the present town of Tai-Van-Foo.

The first English ship made her appearance at Macao in 1635, but the trade of the East India Company with China did not really begin till the year 1670, when the company established a trade with Amoy and the Island of Formosa and in 1684 with Canton, where they set up a factory. Towards the end of the seventeenth and the beginning of the eighteenth century, the English opened up a trade with the town of Nin-Bo and with the Island of Chusan where they built another factory, but this they soon afterwards abandoned. Finally, in 1784, a beginning was made of trade relations between China and the United States of America.

The trade undertakings of Europeans in China were at first conducted irregularly and with interruptions in consequence of the constant acts of

[1] Our famous traveller, General Prjevalski, puts the population of Tibet still lower, viz., 1,500,000 to 2,000,000 souls. (See *Russki Viéstnik for December, 1886.*)

[2] The trade with this town only continued up to the year 1542 (see under the head of "Information relating to the Chinese province of Che-Tszian" on pp. 118-120 of Lieutenant Matusovski's Russian text.)

oppression of the Chinese Government, which always looked with great distrust on the development of commercial activity, on the part of Europeans, in the "Middle Kingdom." This state of affairs, which had so often called forth misunderstandings and which had occasioned frequent collisions between the local authorities and the European traders, led, at last, to open war, which was declared between England and China in 1842. This was terminated in the conclusion of the same year with the so-called "Nankin Treaty of Peace," by which, in addition to Canton, where European trade had, by this time, been successfully established, there were opened to Europeans the four following seaports: Amoy, Nin-Bo, Shang-Hai, and Foo-Choi-Foo. Moreover, by the same treaty the Chinese admitted the right of the English to the Island of Hong-Kong, which they had already occupied since 1841.

Soon afterwards, viz., in 1844, the United States of America and France concluded similar treaties with China, and in these agreements it was, amongst other things, expressly stated that the rights acquired by these States should be extended to European nations generally trading with China.

In 1858, after a fresh war between England and China, which arose in consequence of further acts of oppression on the part of Chinese officials towards European merchants and of insults to the British flag shown by Lian-Huan, governor-general of the provinces of Hooan-Doon and Hooan-Si, the Government of the Bogdo-Khan concluded, at Tian-Tszin, another Treaty of Peace between England, France, Russia, and the United States of America. It was not long, however, before the Chinese refused to carry out the conditions of this treaty and in consequence of this refusal, on their part, there went forth yet another Anglo-French military expedition whose operations terminated with the occupation of Pekin in 1860 and compelled the representatives of the "Middle Kingdom" to sign fresh conditions of peace, which were ratified at Tian-Tszin.[1]

[1] In addition to the several treaties which have been concluded between Russia and China and of which the text is given in the appendices to this work, the following treaties have been entered into by the Chinese with other European and American Powers and with Japan:—

With Great Britain. — The Treaty of Nankin, dated 29th August (10th September), 1842. A Code of Regulations regarding transit dues, dated at Hong-Kong 26th June (8th July), 1843. A Supplementary Convention, dated at Hoo-Min-Chan (to the south of Canton), signed on board the steamer "Tiger's Mouth" on the 8th (20th) October, 1844. The Tian-Tszin treaty dated 28th June (10th July), 1858. The Shanghai tariff and code of trade conditions, dated 8th (20th) November, 1858. The Pekin Treaty of Peace, dated 24th October (5th November), 1860. The Pekin Convention, dated 5th (17th) March, 1866. The revised Treaty of Pekin, dated 24th October (5th November), 1869 (this was never ratified). The Convention of Chi-Foo, dated 13th (25th) September, 1876.

With France.—Treaties concluded at Whampoa (to the south of Canton) on the 3rd (15th) July, 1844, and at Tian-Tszin on the 27th June (9th July), 1858. The Pekin Convention, dated 25th October (6th November), 1860. The Tian-Tszin Treaty of Peace, Friendship and Trade, dated 9th (21st) June, 1885. A Code of

On the basis of these treaties, in addition to the existing five free ports, the following places were opened to Europeans:—Noo-Chooan, with the port of In-Tszi, in Manchuria, and close to the mouth of the Liao-He River, which falls into the Gulf of Liao-Doon; Tian-Tszin, in the province of Chi-Li; Den-Choi-Foo, which was, however, soon exchanged, owing to its bad anchorage for vessels, for the port of Chi-Foo in the province of Shan-Doon; Chen-Tszian-Foo, Tszu-Tszian-Foo, and Han-Koi on the River Yan Tszi-Tszian; Chao-Choi-Foo, with the port of Shan-Toi (or Swatow, according to a more southern method of pronunciation) in the province of Hooan-Doon; Tai-Van-Foo, with the port of Da-Hoi or Ta-Koi, Tszi-Loon or Ki-Loon, with another immediately adjacent port called Dan-Shooi or Tam-Sui, on the Island of Formosa; Tsoon-Choi Foo, with the port of Hoi-Hoi on the Island of Hai-Nan. Lastly, after the Convention conclued at Chi-Foo, between Great Britain and China in 1876, Europeans were allowed to carry on trade with, and to have their own consuls at, the four following points:—Oo-Hoo-Sian in the province of An-Khoi, I-Chan-Foo in the province of Hoo-Bei, Ven-Choi-Foo in the province of Che-Tszian, and Bei-Hai (or Pak-Hoi, according to local pronunciation) in the province of Hooan-Doon.[1]

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trade regulations, respecting the trade across the Annam frontier, concluded at Tian-Tszin on the 13th (25th) April, 1886.

With Germany.—The Treaty of Tian-Tszin, dated 2nd (14th) September, 1861. The Pekin Supplementary Convention, dated 31st March (12th April), 1880.

With the United States of America.—Treaties concluded at Van-Si (a suburb of Macao) on the 3rd (15th) July, 1844, and at Tian-Tszin on the 18th (30th) June, 1858. The Washington Supplementary Convention, dated 28th June (10th July), 1868. The Pekin Treaty of Peace, dated 7th (19th) November, 1880.

With Peru.—The Tian-Tszin Convention and Treaty, dated 26th June (8th July), 1874.

With Brazil.—The Tian-Tszin Treaty, dated 5th (17th) September, 1880. This treaty was revised on the 3rd (15th) October, 1881.

With Japan.—The Tian-Tszin Treaty and Trade Agreement, dated 13th (25th) September, 1871. The Pekin Convention, dated 31st October (12th November), 1874.

With Austro-Hungary.—The Pekin Treaty, dated 2nd (14th) September, 1869.

With Italy.—The Pekin Treaty, 26th October (7th November), 1866.

With Spain.—The Tian-Tszin Treaty, dated 10th (22nd) October, 1864. The Pekin Convention, dated 17th (29th) November, 1877.

With Portugal.—The Tian-Tszin Treaty, dated 13th (25th) August, 1862. This treaty remained unratified.

With Denmark.—The Tian-Tszin Treaty, dated 13th (25th) June, 1863.

With Holland.—The Tian-Tszin Treaty, dated 6th (18th) October, 1863.

With Belgium.—The Canton Agreement, dated 25th July (6th August), 1845. The Pekin Treaty, dated 2nd (14th) November, 1865.

With Sweden and Norway.—The Canton Treaty, dated 28th March (1st April), 1847.

(*Le Bidart. Mittheilungen der K.-K. Consulats-Behörden.* Wien, 1882. And information published by the Russian Ministry for Foreign Affairs.)

[1] Detailed information, concerning the Chinese ports open to foreign trade, will be found under the head of each, in the description, given in Lieutenant Matusovski's work, of each of the provinces in which such port is situated.

In all the above-enumerated ports Europeans of all nations enjoy equal trading rights, but Russian trading and political interests are confined for the present to the following points:—Foo-Choi-Foo, Han-Koi, Tian-Tszin, Shang-Hai, and Chi-Foo, at all of which there are Russian Consulates.[1] Russian Consulates have likewise been established in the most important towns of Outer China (*i.e.*, of China without the Great Wall), viz., at Urga (in Northern Mongolia), at Chuguchak (in the Circle of Tarbagatai), at Kuldja (in the Ili tract), and at Kashgar (in Eastern or Chinese Turkistan).[2]

At Pekin also Russia maintains two missions—one Political, the other Spiritual.[3]

After the conclusion of the Nankin Treaty of Peace, a beginning was made of regular trade relations with China on the part of Europeans of all nations. The extent of this foreign trade, in 1845, with the five open Chinese ports was as follows:—The imports were valued at 14,077,790 *lans* (the average value of a *lan* is about two silver *roubles*, or say, seven shillings); and the exports at 25,464,670 *lans*, so that the entire trade returns of Chinese foreign trade, for the year in question, was represented by the sum of 39,542,464 *lans*. But from the time of the opening, in 1860, of fresh markets for international trade, the mercantile relations between Europeans and Chinese have received a further considerable development.

The total returns of the foreign trade in all the open ports of China up to 1886, are as follows:—

Year.	Imports.	Exports.	Total value.
	Lans.	*Lans.*	*Lans.*
1875	67,803,247	68,912,929	136,716,176
1876	70,269,574	80,850,512	151,120,086
1877	73,233,170	67,445,022	140,678,192
1878	70,804,027	67,172,179	137,976,206
1879	82,227,424	72,281,262	154,508,686
1880	79,293,452	77,883,587	157,177,039
1881	91,910,877	71,452,974	163,363,851
1882	77,715,228	67,336,846	145,052,074
1883	73,567,702	70,197,693	143,765,395
1884	72,760,758	67,147,680	139,908,438
1885	88,200,018	65,005,711	153,205,729
1886	87,479,323	77,206,568	164,685 891[4]

[1] At the two last-mentioned points the officers are not official.

[2] In virtue of the Treaty concluded at St. Petersburg in 1881 Russia has the right to establish Consulates also in the following Chinese towns: At Soo-Choi (at the western extremity of the Great Wall), and at Turfan (in the province of Han-Soo-Sin-Tszian).

[3] The Russian Political Mission at Pekin has existed since the year 1861, but the Spiritual Mission dates back to the time of the Kiakhta Treaty of 1727. Neither to Russians nor to other foreigners, however, has the right to trade at Pekin been granted.

[4] "Returns of Trade at the Treaty Ports of China and Trade Reports for the years 1885-1886.

The customs dues, received by the Chinese Government from foreign traders during the above period, fluctuated between 11,968,109 *lans* in 1875, and 15,144,678 *lans* in 1886, in which year trade returns stood at their highest figures.

According to the measure of the trade operations of foreigners with China, Great Britain occupies the first place, since her trade returns amount to almost 75 per cent. of the entire export trade of that country by sea; to France falls about 10 per cent., to Germany 5 per cent., and to Russia less than $2\frac{1}{2}$ per cent.[1]

Administrative Organisation of the Chinese Empire.

The highest State departments of the Chinese Empire are centred at Pekin. They comprise the following:—(*a*) Nei-He, or the Great Secretariat, which, in point of antiquity and importance, may be compared with the State or Governing Senate of the Russian Empire. Amongst the members of the highest officers of the Nei-He are the following chancellors, the Da-Se-Shi, who is popularly known as the He-Lao. (*b*) The Tszoon-Tszi-Choo, or the President of the Privy Council of the Bogdo-Khan. This is the most influential department of all. (*c*) The head of the Six Ministries or Palaces, viz., the Ministry of Civil Grades or the Li-Boo; the Financial Department or the Hoo-Boo; the Lord Chamberlain's Educational Department or the Li-Boo; the War Department or the Bin-Boo; the Judicial Department or the Sin-Boo, the Public Works Department or the Hoon-Boo. Of the other Chinese great State departments those especially noticeable are:—1. The Li-Fan-Yooan, the Colonial Office or the so-called Palace of Outside Relations. This department, up to the year 1860, corresponded direct with the Russian Governing Senate. 2. The Tszun-Li-Yamin, a new Chinese department which is an Administrative Office for Foreign Affairs.

For the purposes of administration the whole of the Chinese Empire comprises:—(*a*) Nineteen *Shens* (provinces or governments),[2] which have long had an established administrative system of their own. (*b*) Manchuria, which is the private property of the reigning dynasty of China, and of which the two northern provinces are under a purely military administration. (*c*) Mongolia, Tarbagatai, Ili, and Tibet, wherein the Imperial officers exercise a greater or less degree of mere supervision over the actions of the hereditary Khans and elders, who govern the entire population, save the Chinese colonists as belonging to the ruling race.

The whole of these provinces or *shens* are sub-divided into *foo* (districts), *chi-li-choo*[3] (circles), and *chi-li-tin* (prefectures). All three

[1] Skalkovski, "Russian Trade in the Pacific Ocean." Published 1883 (p. 137).

[2] A nineteenth province or government was lately formed by an edict of the Bogdo-Khan, dated 5th (17th) November, 1884, under the name of Han-Soo-Sin-Tszian, and it includes Eastern Turkistan and the circles of Hami, Barkal, and Urumtchi. The town of Urumtchi was fixed upon as the administrative centre of the new province.

[3] The word *chi-li* signifies "independent" or "governing."

of these sub-divisions are administered by separate officials, who are, however, directly subordinate to the superior rulers of the provinces. The difference between the rulers of the several sub-divisions is that the administrator of a *foo* usually has a more extended jurisdiction than that of either a *chi-li-choi* or a *chi-li-tin*. But all such minor administrators have various degrees of power. Besides the minor sub-divisions above indicated, there is yet another administrative classification known as cantons or *ooyezds*. This classification goes by the simple names of *choi*, *tin*, and *sian*, without the prefix of the words *chi-li*, and the powers exercised in each of these administrative minor sub-divisions vary according to each particular term. All such designations are affixed to the proper name of each particular town, and thus define not only the administrative importance of such town, but show also what is the particular system of administrative organisation which is in vogue therein.

The several territorial sub-divisions above enumerated are under the following officials:—A province is ruled over by a *soon-foo* or *foo-tayu*; a district by a *chi-foo*; a circle by a *chi-choi*; a prefecture by a *tin-toon-chi*; a canton by a *chi-sianu*. The majority of Chinese provinces are grouped under two and sometimes under three general administrations, and these groups come under the jurisdiction of a Tszoon-Doo, who is also called Chi-Tai, or Governor-General. It is to this class of Chinese official that Europeans generally apply the title of "Viceroy," especially as the powers conferred on such a personage are very extended.

Amongst the number of the other principal officials who form part of the Chinese local administrations are the following[1]:—

Boo-Chen-Shi or Fan-Tai, or the head of the treasury of each province.

An-Cha-Shi or Nai-Tai, or the highest judicial officer of a province.

Dao-Tai who sometimes rules over several districts (*foo*) or circles (*chi-li-choi*), and who, in such a capacity, is a sort of Vice-Governor. A Dao-Tai is often also the head of a separate department, as, for instance, customs, salt, commissariat, or he may be a tax-collector. A Dao-Tai again may direct the relations with Foreign Consuls at any of the open trading ports of the Chinese Empire.

Tszian-Doo or director of customs.

The private secretaries of the several Chinese administrators likewise enjoy a great status in the Government of the country. The titles of such secretaries are Shi-Yay, those for special charges are called Vei-Yuan, and those for inditing despatches Chai-Huan.

In Manchuria, Mongolia, Tibet, Tarbagatai, and Ili the system of Chinese administration is altogether different to that which obtains within the limits of Inner China (*i.e.*, the countries within the Great Wall), so that the administrators of the provinces above-named bear the following designations.

[1] This information has been obligingly communicated by the Russian Consul at Tian-Tszin, Mr. I. V. Paderin, and by Professor A. M. Pozdnaiyeff.

Tszian-Tszun, the Governor of the country or the officer commanding the troops stationed therein. This is held to be a post of very great importance.

Hebei-Amban, the Councillor of a Tszian-Tszun. In ordinary phraseology a Hebei-Amban is simply styled Amban, and by this shorter title Hebei-Ambans are more generally known. As, for instance, the Hebei-Ambans of Urga, Ulyasutai, Tarbagatai, and Kobdo, whom the Chinese likewise style Ban-Shi-da-Chen.

A Foo-Doo-Toon, or Meiren-i-Chan-Hin, is the title of the assistant to the Tszian-Tszun of Manchuria. He may be considered to be of equal rank with a Hebei-Amban as he too exercises the powers of a local governor. He is also the assistant of the *Hetman* in those localities wherein are settled bodies of armed Manchus.

Dzurgan or Halai-Da is the director of the Chancery of a Manchu administrator.

Dzarguchi (a Mongol title), or Boo-Yuan (Chinese title) is that of the judicial officer who resides in every principal trading centre of China without the Wall, for the purpose of supervising trade relations, and of settling all judicial matters arising between Chinese traders and foreigners generally. Thus there is a Dzarguchi at Maimachen (near Kiakhta) who settles all disputes between the Russian and Chinese merchants trading at Kiakhta.

The majority of the holders of the above posts are engaged in both civil and military affairs; but the following Chinese officials are exclusively military :—

(*a*) *In the Chinese Regular Army.*

In-Huan, or commander of a *lian-tszi*, the Chinese fighting unit of a numerical strength of 500 infantry and 250 cavalry soldiers. This personage is also the commander of an *inpan*, or fortified camp, in which there is usually quartered one *lian-tszi*.

Ban-Ban-In-Huan, or the assistant to an In-Huan.

Shao-Huan, or commander of part of a *lian-tszi*.

Tszun-Bin is the same as a Chen-Tai or a Toon-Lin, *i.e.*, a brigade or detachment commander who has a force of five *lian-tszi* under his orders.

Ti-Doo, the same as a Ti-Tai, is a divisional commander or commander of the forces of an entire Chinese province who has a body of troops under his command of five *toon-li* or 25 *lian-tszi*.

(*b*) *In the body of the "Standard" troops, a sort of Cossack force, which is quartered throughout Manchuria and Mongolia.*

Niroo-i-Da or Niroo-i-Chanhin, a *sotnia* or squadron commander. Niroo in the Manchu dialect (or *Soomoo* in the Mongolian and *Tszo-lin* in Chinese) signifies "squadron," and this unit generally consists of two *sotnias* (*i.e.*, about 200 men).

Djalan-i-Da in the Manchu dialect (or *Dzalan-i-Dzanhin* in the Mongolian and *Sai-lin* in Chinese) is the commandant of a cavalry regiment.

Doo-Toon or Hoosa-i-Da is the commander of one "standard," a unit which generally consists of five regiments.

Tszoon-Toon is the commander of troops of all arms of the Service quartered in the "steppe" country.

It may be useful to add to this paper the following explanation of certain affixes to Chinese geographical terms:—

Tszian, he, or *ho,* signify a river.
Shooi, hoi, tsuan, a stream.
Lin, shan, a hill, mountain, or range.
Hoo, a lake.
Bo, tsze, lian, a small lake, marsh.
Hai, a sea and sometimes a lake.
Chen, a small town.
Hooan, chjai, in, a fortified point.
Chjen, tszi, a village or group of hamlets.
Tsoon, Toon, chjooan, poo, a larger village.
Koi, a pass, defile, mouth of a river.
Miao, an idol temple.

Such affixes, in the frequent repetition of geographical terms, are, for the sake of brevity, sometimes omitted. Thus, for example, in place of Yan-tszi-*tszian*, the river, of that name, appears as Yan-tszi; in place of Po-yan-*hoo*, the lake, of that name, is mentioned as Po-yan, and so on.

CAVALRY NOTES—SOUTH AFRICA, 1899-1900.[1]

By Captain J. VAUGHAN, 7th Hussars.

1. Nature of Country.—South Africa is a large-scale country. Miles separate river from river, ridge from ridge; and in all parts are found splendid defensive positions commanding the surrounding veldt. In such a country infantry are lost. However admirable their courage and perfect their training, they must be out-manœuvred, on these limitless manœuvring grounds, by a mounted enemy such as the Boers. Hence, it was apparent to all who had previously served in South Africa that large bodies of mounted troops would be required. It is true that in Natal and the Eastern Transvaal the mountainous country is difficult for horsemen; yet, even there, the distances between the various defensive positions are such as to almost preclude the successful manœuvring of infantry. Moreover, the mounted Boers can change front so rapidly that they can always convert the flank attack of the slow-moving infantry into a frontal attack. We must, therefore, conclude that every column operating in South Africa should be composed chiefly of mounted troops, and we must admit that the greater portion of both the Orange River Colony and the Transvaal is very favourable for cavalry to work over. The chief obstacles to free movement are scarcity of water, grass, and forage, necessitating large convoys, and the difficult drifts through the rivers. On the other hand, both fighting troops and baggage can often move for miles on a broad front.

2. Character of Enemy.—The Boers are a formidable enemy. They have in their ranks, probably, the same proportion of brave men and ordinary men as other nations of European extraction, and what they lose by want of discipline they gain by cunning. Brought up from the cradle to think that deception is the highest of arts, and to despise the Englishman for his openness, they adapt their theories to war with conspicuous success. For, in war, deception is a very valuable asset. On the other hand, they mutually mistrust one another, and herein lies their weakness. They have had the further advantages of knowing the country in which

[1] Captain J. Vaughan, 7th Hussars, the writer of these notes, which he had drawn up, without any intention to publish them, was good enough soon after joining the Staff College to allow me to read them; and I have obtained his assent to their appearing in this JOURNAL. In my opinion the value to be attached to notes on the war depends a great deal on the opportunities the writer had for forming his judgment. Notes emanating from "goodness knows whom" are of comparatively little value. Captain Vaughan served on the staff in French's Cavalry Division, and at my request he has allowed his name to appear with the notes.—LONSDALE HALE.

they are operating, wearing no uniform, which enables them to assume the double *rôle* of soldier or civilian according to the fortune of war in their neighbourhood, and a most perfect intelligence furnished by their womenfolk. They thoroughly understand outflanking tactics and are adepts at fighting rear-guard actions; but, for this reason, they are most sensitive of their own flanks and rear. With the exception of the foreigners and Zarps, they have a fixed determination not to fight to a finish; their favourite motto would appear to be:

"He who fights and rides away
Will live to fight another day."

They have no hesitation about retiring immediately things look bad for them. They will fight obstinately at times without apparent reason, and fly from the strongest position equally without reason. It is easier to guess a Kaffir's thoughts from his face than a Boer's thoughts from his actions.

As a shot the Boer is good from 800 up to 2,500 or 3,000 yards, if he has plenty of time, but often shoots badly at close ranges.

To put the Boer's value as a fighting man briefly: he is a good skirmisher, but a bad fighter.

3. Condition of our Cavalry.—Regulars.—At the commencement of the war the British cavalry were well mounted, trained, and organised, but badly armed and equipped.[1] The squadron and troop leaders were, mostly, as good as could be wished. The men, especially in regiments from India, were seasoned and well trained. For some reason, however, the cavalry were landed late, and had to be used immediately on arrival, with a consequent waste of horseflesh and decreased efficiency.

Colonials.—The Colonial mounted troops consisted of:—

a. Those raised in South Africa.
b. Oversea Colonials.

Regiments of the former varied considerably, the first raised corps, chiefly composed of Rand and Natal men with a sprinkling of old soldiers and police troopers, were excellent. Later raised corps had a certain proportion of townsmen, ship's stewards, cattle hands, etc., who required some time to learn to shoot and ride. The efficiency of these corps varied considerably with the various officers commanding them. This remark also applies to the Yeomanry.

The oversea Colonials were generally excellent. The men rode better than those of the South African corps, and most of them had had some previous military training. Their weak point was their officers, though in some corps the officers were excellent. This is accounted for by the fact that, in the Colonies, commissions are, to a great extent, obtained through political influence. Nearly all the Colonials are bad horsemasters—especially Australians. On the other

[1] The cavalry carbine is a most inferior weapon. No two carbines will make the same shooting, even at close ranges: they are also clumsy and too short in the stock. The sword is most unwieldy, and is carried in a scabbard which absolutely prevents its being kept sharp.

hand, they are good campaigners, they are handy at foraging for themselves and their horses, and at cooking, butchering, and making themselves comfortable.

Mounted Infantry.—The Regular mounted infantry required at least two months' training before they should have taken the field. They were converted from foot soldiers into horse soldiers wholesale, and had to perform difficult duties, such as scouting, patrolling, and escorting convoys, almost without previous training. With unbroken horses, new equipment, new men, and the Boers and the wide world opposed to it, the mounted infantry at the beginning of the campaign must have had a trying time.

Reconnaissance.

4. *Scouting.*—In spite of numerous criticisms—mostly passed by civilians at home, guided by the reports of young war correspondents, whose only stock-in-trade was ignorance and assurance—the scouting was usually good, if not brilliant. The country was often very difficult. The Boers hide themselves most cunningly, and often allow the advanced scouts to pass them before opening fire. I cannot remember a single instance, excepting Sannah's Post—where neither squadron officers nor men of the cavalry can be blamed—when the presence of the enemy has not been discovered and reported in good time. In the brigades of the division with which I served, the information furnished by the reconnoitring squadrons was always most reliable. As a rule, officers made their reports clearly and quickly, and with a good tactical appreciation.

Methods.—Although the results were generally satisfactory, I should like to point out certain methods which are not to be commended.

At the beginning of the war the usual practice was, as in peace training, to send out special patrols—under officers or non-commissioned officers—in advance of and in addition to the ordinary advanced flanking and rear-guard squadrons. Gradually, however, this practice was discontinued except in very special cases. Latterly, the almost universal plan has been for the advanced squadron to extend the files of one or two troops at about 100 yards interval, with the remainder of the squadron in support, from half a mile to a mile in rear. I think this practice sprung up because :—

1. Officers became scarce.
2. Overweighted and underfed horses were liable to be overtaken and cut off by the enemy.
3. A want of confidence from the above reasons.
4. A belief that the Boers shoot badly when opposed by a widely extended line, and that the men so extended are less likely to be hit than if working in groups.

With regard to 2, it must be remembered that during the greater part of the campaign most horses could not gallop 500 yards, and some could not trot that distance, and that consequently the Boer pony could generally gallop rings round the poor dying troop horse.

The disadvantages of this system are :—

1. The line of scouts is very conspicuous; no concealment can be attempted, or use made of the ground.
2. Waste of horseflesh.
3. The troop leader has nothing "under his thumb."
4. The men will often come back at the first few shots, and the whole line may be held up by a few snipers.
5. Men grow careless, and trust to their neighbours instead of using their own eyes.

If this system be permitted at all, men should work in pairs at double the interval; and if one portion of the line of scouts come under fire the remainder should push on rapidly so as to determine the extent and find the flanks of the enemy's position without delay. The system of working with patrols, in addition, of course to the protective detachments for the security of the main body, appears to avoid all the above disadvantages. These patrols should be sent to converge on suspicious spots, which they should approach, as far as possible, without showing themselves. Information thus obtained will be earlier and more accurate than that obtained by the screens of scouts. The detachments protecting the main body should also work with patrols according to the local requirements of the ground; but these patrols should not be so numerous as to form a screen. There are certain places which must be occupied by the enemy if he is in the neighbourhood. In South Africa there are kopjes, ridges, dongas, or other cover; when these are made good, the rest of the ground can be neglected, and much horseflesh saved. Under the present system the screen of scouts rides along as if it expected to find Boers in every tussock of grass on the open veldt, and meanders on at the same pace over high ground, when a halt ought to be made and a thorough, careful search made of the ground in front before proceeding.

Every troop should have at least one interpreter with it, as information can often be obtained from natives. This information should always be verified and distinctly separated from what has been seen. The South African Irregulars had a great advantage in knowing the language, but their reports were often less reliable than those of the Regulars. Many colonials seem to think that if sent out scouting they must come back with a "yarn," and so destroy otherwise good work.

7. *Outposts.*—Outposts were not often disturbed at the commencement of the war when the Boers were generally awaiting an attack. On the 4th January, 1900, however, near Colesberg, a squadron of the Inniskillings was attacked by a strong force of Boers soon after daybreak, and but for the prompt action of some of the 10th Hussars and a section of Horse Artillery, would have suffered very severely. The outposts of the 8th and 14th Hussars were also attacked near Machadodorp on 14th October, 1900, and suffered heavily. The Boers crept up in the dark within 30 yards of our piquet before they were discovered. In both these cases the near approach of the enemy was attributable to

insufficient patrolling. Patrolling at night is jumpy and difficult work; but it is most necessary, especially before daybreak. I think the following points require attention :—

1. Necessity of patrolling.
2. Piquets to have some cover, either natural or entrenchments, sangars or barricades.
3. More care should be taken not to reveal the exact whereabouts of the piquet to the enemy.

Owing to the wide undulations of the country and the long range of the enemy's weapons piquets generally went out mounted; they did not fall back if attacked, but held their ground till supported. This support should not as a rule be sent to the threatened point, but to some other point which will command or outflank the attackers.

Our most glaring fault in outposts is want of concealment. A Boer scout watching a British force going into camp ought to be able to locate each piquet from a distance of 3 or 4 miles. The infantry further assisted the enemy by marching a sentry with a fixed bayonet backwards and forwards in front of their sangar.

What is required is a sentry who keeps *his eyes at attention* and *his body hid*, not one who stands at attention and sees nothing.

8. *Fighting.*—The main characteristic of the war has been continual skirmishing and an absence of big battles. Herein the Boers show their appreciation of their own qualities and of ours. The cavalry fighting has been almost entirely on foot, because of:—

1. The debility of the horses.
2. The dislike of the Boers to the open and to fighting to a finish.
3. The natural defensive positions of the country, consisting chiefly of kopjes inaccessible to horsemen.
4. The hesitation of leaders to accept the heavy risks of shock tactics, without the possibility of obtaining a decisive result.

There were four instances in which the cavalry meant charging home :—1. Elandslaagte. 2. Leaving Modder River on the road to Kimberley. 3. Sand River. 4. Diamond Hill. In all these cases the enemy went "as one man," and our losses in the advance were trifling. When our cavalry left Modder River, near Klip Drift, we found the Boers holding a very strong position to bar our advance on Kimberley. Their left flank rested on the river, their right extending westwards towards Magersfontein, the foreground rose gently from the river to the enemy's position. Under cover of the R.H.A., the Lancer Brigade (9th and 16th), galloping up this glacis, charged the centre of the enemy's position. Although our right flank was exposed to a heavy enfilade fire, our losses were small, while the enemy was completely scattered and virtually offered no further opposition during that day. It is interesting to consider how many lives and how many hours would have been

required to have successfully captured this position on foot. At Zand River the Boers were in an open valley about 1,200 yards distance when the 8th Hussars tried to charge them. Although the horses could only raise a feeble gallop, about 300 Boers fled from the terrifying spectacle of 200 men flogging their horses with the flat of their blunt swords. Several Boers were killed, chiefly by officers who were well mounted, and several captured; and, but for the inferiority of our swords and horses, many more must have shared their fate.

9. Skirmishing.—The Boers are very much better skirmishers than our men; they are quick on and off their horses and take cover rapidly; moreover, they have a much better weapon. The Mauser rifle not only outranges the carbine, but it is easier to shoot with and the clip loading is far superior to our clumsy magazines. It was consequently often found necessary to have a section of guns or pom-poms pretty close to the scouts. Pom-poms have a good moral effect on Boers, and are very quick at getting the range; they were most useful in these continual skirmishes with advanced or rear guards.

10. Occupying Positions.—Boer Method.—But it is not only in skirmishing that our cavalry can learn from the Boers. They occupy ground most skilfully. Twenty Boers will occupy a kopje of half a mile or a mile frontage, and it is impossible to tell whether there are 20 or 200 till you get round their flanks, or shell them out of it. Their horses are generally left in groups and minded by the after-riders.

British Method.—Compare our clumsy method. A squadron is ordered to occupy a kopje, the men halt, form up, advance, extend, and finally occupy the position—generally in a straight line. At the commencement of the war, the squadron leaders did not seem to realise that the real object is to *cover every bit of the foreground by the fire of some carbine.* The M.I. were even slower than the cavalry, and many officers seemed to want every man in their command within reach of his voice and eye. The colonials were accustomed to working looser. I remember a squadron of New Zealanders galloping to support a cavalry patrol engaged on a kopje with a superior number of Boers. The leader pointed out the kopje, the men slung out by sections at a smart gallop, the men of each section dashed up to the base of the kopje, flew off their horses, and in a few seconds climbed the kopje like a swarm of ants, and each man from the cover of a rock started firing at the enemy's position. The Nos. 3 collected their four horses, and stowed them away in the folds of the ground or among the rocks.

The officer commanding the New Zealanders told me that his men always worked in the same sections as far as possible. This method of occupying a position—which must of course be first reconnoitred—has the advantages of quickness, cover for men and horses, and simplicity. Sections would require a little training to make them spot the place to make for, but no words of command are required.

11. Advanced Guards.—If you are held up during your advance, the universal rules to follow are "extend and outflank." With Boers the

axiom that "10 men on the flank are worth 100 in front" is especially true. If you are fortunate enough to see a Boer in the open always fire at him, however far, as if he hears your bullet whistle he will go.

Rear Guards.—The Boers are adepts at rear guards—possibly owing to much practice. In this case, if you wish to get through the rear guard, you must depart from the above principle, incur risks, and go right in in the centre; otherwise, the enemy gain requisite time to remove wagons or guns. The Boers have lately taken to worrying our rear guards, but, as they are not fond of taking risks, have never achieved anything beyond sniping one or two scouts and getting themselves well shelled.

During the march from Bloemfontein to Pretoria the cavalry was fighting Boer rear or flank guards nearly every day. Critics in England were anxious to know why we failed to capture the Boer guns. The reason is simple. There was no infantry fight; the enemy were never beaten but merely retired from position to position to avoid being rounded up by the cavalry columns operating on their flanks. They often trekked at night, and generally gave their wagons and most of their guns 24 hours' start. Their usual rear guard was composed of 2 guns, 2 pom-poms, and 1,000 to 2,000 of their best mounted men and the Zarps. Our cavalry advanced guards were composed of tired men on emaciated horses. Both the Boer guns and rifles outranged ours, and when we got them in a tight place they galloped away *ventre-à-terre* to the next cover.

Bloemfontein-Kroonstad March.—The march from Bloemfontein to Kroonstad was performed on newly detrained remounts carrying always two days' ration and forage—a total of 21 stone. The distance is about 150 miles by the flank routes followed by the cavalry. One brigade left Bloemfontein on Sunday, the other on Monday. Both were astride the Valsch River, 10 miles west of Kroonstad, on Friday afternoon, and the rail was cut north of Kroonstad that night. A large proportion of these two weak brigades were on outpost every night, and, in addition to fighting every day, the men had to forage, butcher, etc., for themselves, as the baggage was unable to keep up. The record of this march then stands:—30 miles a day; the enemy turned out of two strong positions and in further full retreat without the infantry being seriously engaged; the cavalry fought every day and were entirely *en l'air*. Could any troops have done more?

12. Marching.—It is universally agreed that the present weights must be reduced. Squadron wagons, carts, or pack horses must be provided to march immediately in rear of the fighting column. The squadron wagons or carts should be horsed, their teams interchangeable with horses in the ranks with incipient sore backs, etc. In South Africa the number of hours during which the horses have been saddled up have generally contributed more to wearing out horses than the distance traversed. The cavalry being often in touch with the enemy throughout the day were frequently unable to off-saddle, but opportunities of off-

saddling were sometimes neglected. There were more cases of sore backs than there ought to have been, but they were attributable to bad saddlery (American especially), heavy weights, long hours, and emaciated horses—not to want of care on the part of regimental officers and men.

13. Horse Management.—Horse management varied in different corps. Some did better than others, but it was impossible for any mortal to keep horses fit under the circumstances. The forage was always insufficient. Full rations were generally 10 lbs. of oats. No hay or bran except very occasionally when on the railway. During the Kimberley-Bloemfontein period 20 lbs. were issued for three days; 10 lbs. to be carried in nosebag, 10 lbs. in cornsack. With rotten nosebags, waste on march and in distribution, it was a lucky horse that got more than 5 lbs. a day. Whilst halted round Paardeberg the ration fell to 2 lbs. a day, and never exceeded 8 lbs. I do not think that the horses actually consumed on an average more than 5 lbs. a day from 10th February to 13th March. There was very little grazing to be obtained, and the water was often insufficient. At the end of April only about 10 per cent. of the horses which left Modder River remained in the ranks. That was the worst period of the campaign for the horses. Further north more forage was obtainable in the country, and the ration issued was larger (10 lbs).

14. Conclusions.—Lessons to be Learned by Regimental Officers.—The conclusion arrived at is, that though severely handicapped, the cavalry have done their utmost, than which no man can do more. Putting aside the larger questions of arms, equipment, transport, remounts, etc., which rest with the higher authorities, we may, with profit, consider what can be done by regimental officers to improve the cavalry for war, not only in South Africa, but in any possible or probable theatre.

The points which appear capable of improvement fall under four headings :—

a. Reconnaissance.—Train the *mind as well as the muscle.* All ranks must be taught to think. The greatest fault in our training is that in peace subordinates never think for themselves, and consequently are unable to do so in war. Every problem in reconnaissance, whether of a patrol or a division, must be dealt with separately on its merits. It is not to be expected that all N.C.O.'s and men in a squadron will make equally good scouts. They should all be trained as at present, and those who are keen and likely to turn out well should receive a further training. They should be taught carefully stalking others, hiding themselves, tracking, observing the lie of the country, the run of the rivers, etc , and to report what they see. They should also frequently be given problems requiring them to extricate themselves from difficult situations, to make them think. This is not an original proposal and is difficult to carry out in England, where squadrons are mere nurseries for furnishing drafts to regiments abroad, and suitable ground is sometimes lacking; but squadron officers might do more than is done to make their men think. What is required is to develop the men's common sense and give them an eye for ground.

b. Dismounted Work.—Cavalry must be better trained on foot. All operations should be carried out with an idea against a supposed or marked enemy. Men should be made to be quicker getting on and off their horses. Positions should be occupied on the lines previously indicated in No. 10. Firing line should be taught to take cover and occupy the ground according to its size and contour. More attention might be given to Morris tube practice and judging distance, but shooting cannot be improved till we have more ammunition, more ranges, and a better weapon.

c. Horse Management.—Our present system provides more for the care of horses for the show-yard than the field. Squadron officers might instruct their subalterns and the latter their troops in the care of horses *in the field* as well as in barracks, remembering that in the field no complicated line, gear, grooming kit, etc., can be carried, and that everything must be simple.

d. Campaigning.—All men should also be taught roughly butchering, cooking, tree-felling, leather-stitching, etc.

MODERN ARTILLERY.[1]

By Lieutenant A. T. DAWSON, late R.N.

MODERN artillery is a very complex subject, for in the attainment of that great power and precision which characterise the present-day artillery, notwithstanding the minimising of its weight, there have been introduced innumerable yet indispensable details, each the result of patient research on the part of our greatest scientists, and the production of the highest mechanical skill. So numerous and interesting are the problems involved that in a reasonably brief lecture one can only touch the fringe of the great subject.

It is quite impossible to enter into detail, and I therefore propose, after briefly considering general governing principles, to select certain types of ordnance, both British and foreign, in order to point out specific differences and to compare generally the different systems employed, with the view, if possible, of ascertaining relative advantages and disadvantages.

Having regard to the present important position that artillery holds in all countries, and to the direct relation which the possession of a sufficient number of efficient weapons bears to the safety of an empire, I feel that I shall be excused at the outset of my address in seriously pressing home to the public mind through the medium of this influential society the necessity of the British Empire placing the most modern and effective of weapons at the disposal of our brave sailors and soldiers wherewith to defend in times of necessity the integrity, the independence, and possibly even the existence of our Empire.

I do not wish to pose in any way as an alarmist, for I am sure that the Government are endeavouring to do all that practically lies in their power to put our sea and land defences in order; but having regard to the activity that the other great nations of the world are showing in the employment of the most modern arms to the exclusion of inferior and obsolete weapons, it is the duty of all to be incessant in their support of Government measures to place our land defences, as well as our fleet, in possession of artillery second to none in the world.

War-ships with Muzzle-Loaders.—I shall not in this somewhat brief address refer to the muzzle-loading guns, of which, alas! we still have many remaining—both in ships and forts; but while my main purpose is to consider the more modern pieces of ordnance and their equipments generally, I should like to point out that I consider that in the present

[1] Paper read at the Society of Arts, 6th March, Sir Benjamin Baker, K.C.M.G., F.R.S., in the Chair.

day of modern artillery, a badly-armed ship is, from a fighting point of view, worse than useless to the country, because if it happens to come into the line of battle, it would be put out of action by a ship perhaps only armed with a few modern guns, with possibly no armour protection and manned by a very scant crew, providing always she has the speed and is able to control the range.

I will take as an example the "Inflexible," which we may consider heads our long list of vessels armed with muzzle-loaders, and assume for the sake of illustration that she came across a French cruiser, say, of the "Cassard" class. The "Inflexible" has a crew of, say, 485 men, as against the 385 men of the French cruiser. She cost (it is true, many years ago) about a million sterling, as against, say, £318,000 of the French ship. Now, at a range of 8,000 yards or beyond, the French ship would be in safety against the fire of the "Inflexible's" guns; whereas at this range the French cruiser, with the aid of her modern guns and of modern telescopic sights, would be able to make good practice against the British ship, and in my opinion would put her quickly out of action by firing large capacity high explosives and other modern shells.

Let us, from this particular illustration, consider further the cost to the country. Each man employed on board ship costs us about £100 per annum, and thus the wages bill for 485 men is at the rate of £48,500 per annum. The upkeep during war of a ship of the "Inflexible" class in the expenditure of coal alone, since it would be at famine prices, would be enormous, and the cost of repairs, etc., enormously disproportionate to the services rendered.

But, apart from these monetary items, there is the far more important question of the ineffective employment of the 485 men, whose training represents a large national asset. And what would be still more deplorable, from more views than one, if these obsolete ships, of which there are very many in the Service, are sunk or taken, a very large and very unpleasant gap would be made in our *personnel*.

Other similar illustrations might be given, but the one surely affords strong reasons for either selling the old obsolete ships and expending no more money on them even in peace-time, or for arming them with modern artillery. The latter course seems to me more advisable, as armaments of a kind can be provided much more quickly than new ships to replace the old vessels, and history has shown the value of reserve ships to fill up gaps in naval warfare, even if they be not quite up to the mark from a ship construction point of view. The nation which can more expeditiously challenge anew the enemy after a hard-fought battle is the more likely to succeed ultimately.

Quick-Firing Guns for Fast Merchant Steamers.—The power of the unarmoured ship of great speed and high gun power to control the range, to which I have been referring incidentally, represents the importance of the armed merchant transports, and enforces the value of the mercantile fleet possessed by maritime nations, of which we are the greatest. For my own part, I would advocate that all ships sailing under the British flag over a tonnage of, say, 3,000 tons displacement, and having a speed

of, say, 17 knots, should be called upon to have suitable deck attachments for the accommodation of 6-inch Q.F. guns. The inconvenience in peace-time would be inappreciable, and the extra cost and weight necessary for strengthening the forecastle deck during construction would not materially affect the price or weight of the ship—it could be done at a very small extra cost. Such ships would be invaluable to the Admiralty as armed cruisers in war-time, if there were provided at convenient ports really modern 6-inch or higher-powered guns to instal on board them. I mention this fact particularly because I am sure we have not at the present time a reserve of really modern long-range artillery suited to this and other purposes, the need for which must inevitably arise during the progress of a war.

Principal Factors in the Evolution of Modern Artillery.—I should like to turn now more directly to the principal factors which have brought about the evolution of modern artillery. And first in importance must be placed improvements in propelling agents in powder. The modern smokeless propellents have entirely altered the conditions of modern warfare and have done most to render obsolete artillery weapons useless and dangerous to the nation which does not keep pace with the development of modern artillery enterprise. The initiation of modern explosives has made it possible to more than treble the energies of guns as compared with the days of black powder, bringing into the arena of practical warfare long-range fighting by land and sea, such long-range fighting being rendered accurate by the use of telescopic sights, range-finders, etc.

Secondly, it has rendered a very great rate of fire possible, owing to the smokelessness of the powder, the object aimed at being practically visible at all times. Furthermore, there is practically no residue left in the gun ; therefore, as soon as one cartridge is fired, another can be put in without the elaborate sponging, etc., required with the old powders. This also facilitates considerably a quick rate of fire. There are, of course, a great many other advantages which may be credited to the initiation of smokeless powders, but the two great advantages resulting therefrom are really higher energies and a quicker rate of fire. In field operations, even more than at sea, the strategical advantages of smokeless powder are invaluable and more or less obvious, so that they need not be enlarged upon.

Smokeless Powders : Cordite versus *Nitro-Cellulose.*—Having laid stress on the importance of smokeless powders in connection with modern ordnance, it may be well to say a few words on the explosive compounds themselves. In the days of black powder the velocities were limited to about 1,600 foot-seconds, owing principally to the quick rate of burning of the powder. The modern propelling powders, such as the various forms of nitro-cellulose and nitro-glycerine, are much slower burning, and thus longer guns can be utilised in which a great number of expansions of the gas are obtained, thereby increasing the velocity to a very much greater extent, in many cases up to 3,000 foot-seconds. As

to the type of powder to be used as a propellent, there is now practically no difference of opinion throughout Europe and America, nitro-cellulose being preferred on all hands. The United States, Russia, and France have adopted the nitro-cellulose form for some time. Germany has been late in its adoption, having used a form of nitro-glycerine powder containing about 25 per cent. nitro-glycerine, but has now practically, I believe, decided to adopt a nitro-cellulose powder. Other small countries in Europe have not definitely decided on a particular type of explosive, and may be said generally to be carrying out experiments. The fact, however, of nearly all the great countries of the world, excepting our own, having adopted it, is to some extent a reason why our own Government should give it the greatest consideration. At the present time Great Britain is using cordite containing about 57 per cent. of nitro-glycerine. This powder has now been in use for about nine years, and in its day may be said to have been one of the best known explosives at the time of its introduction: it was absolutely necessary for our naval supremacy to introduce a smokeless powder; hence, I would represent that at that time Great Britain acted advisedly. The experience of the French until quite recently cannot be said to have been too highly satisfactory, as all will recall the serious explosion at Toulon not many years ago, which we have every reason to know was due to a deterioration of the powder in storage. Furthermore, I understand that the Russian Government's experience until three or four years ago was not all that could be desired, the nitro-cellulose from which it was made not being of the finest quality. In the United States they have now generally adopted nitro-cellulose powder in their fleet, and are introducing it into their land Service. I understand the experience with this powder in the United States Navy is everything that could be desired, although I believe they are constantly carrying out experiments with a view to improvement. The United States land Service, however, have until quite recently used a nitro-glycerine powder containing about 10 per cent. nitro-glycerine. The experience they have had with their powder has been anything but satisfactory, and on many occasions they have had serious high pressures in their guns, in some cases completely destroying the artillery using it. The experiences of foreign Powers tend to show the wise policy of the British Government in not adopting a nitro-cellulose powder at the time of its original initiation. Since that period, however, the manufacture of nitro-cellulose powders has very greatly improved, and the powders now being adopted by Russia and Germany are quite as safe in their use as cordite and other known modifications of cordite having various percentages of nitro-glycerine.

Nitro-cellulose powder has the great advantage of being capable of producing in modern artillery the highest possible ballistics with the least possible amount of wear to the gun; and therefore at the moment its introduction should be treated from a most serious standpoint. It is, I think, well known to all of you that the temperature of explosion of cordite is practically double that of nitro-cellulose powders. This great difference in temperature of explosion has a great bearing

upon the wear of guns, for with so high a temperature of explosion as cordite, far exceeding the melting point of steel, it is not reasonable to expect a gun to last for many rounds, and especially if large charges are used, developing heavy volumes of gas. Now, in order to obtain high ballistics, it is very necessary to develop very large quantities of gas, with the view of keeping the volumes of expansion of the gas at the higher pressures as long as possible, and continuing these pressures to the muzzle of the gun. If cordite is used, having this very high temperature of explosion, these volumes of gas at the high pressure must of necessity seriously affect the bore of the gun, especially at the commencement of the rifling. The nature of the wear of the bore with cordite is also very serious, taking the form as it does at the commencement of erosion of very thin fine lines, which develop as the rounds are continued, completely washing away the surface, and quite abnormally enlarging the seat in the gun, where the shot is rammed home. This, after a few rounds, allows the shot to be over-rammed, increasing the volume of the chamber, which, in its turn, diminishes the pressure, reducing the energy of the gun, and varying the velocities, and therefore the range, accuracy, and indeed every point which to the gunner is an absolute essential. Furthermore, the wear of the bore of the gun prevents the proper centring of the projectile at starting, causing it in many cases to gyrate when it comes under the influence of the rifling. In guns of low power using cordite, where only small charges are required, the effect is, of course, much less than in guns using large charges; but I contend that, as it is necessary for modern artillery, except that for special purposes, to have the highest possible ballistics, it is of primary importance to use a powder which, as far as possible, gets over the objections I have just mentioned. The effect of using cordite in, say, 6-inch high-powered guns, having velocities of 2,800 feet to 3,000 feet is to entail a loss of some 500 to 600 foot-seconds, after about 200 rounds have been fired, representing a loss of energy of about 34 per cent., owing to the development of erosive effects. Furthermore, these velocities vary very materially with the temperature, and in some guns as much as 3 feet per every degree Fahr.

The question really comes to this: that if cordite is used, no higher velocity than, say, about, 2,500 feet can be obtained for any reasonable number of rounds, whereas with nitro-cellulose powder, velocities up to and exceeding 3,000 feet can be easily obtained, without the objections attendant on the use of cordite; I, therefore, shall continue to urge that a nitro-glycerine powder is not suited to modern artillery, and that any country continuing to use it must of necessity be at a serious disadvantage with a country making use of a nitro-cellulose powder. The effects in other countries of powders containing from 10 to 25 per cent. of nitro-glycerine have, from an erosion point of view, been superior to those containing a higher proportion; but with such a powder a much larger charge has to be used in order to obtain the same ballistics, and the saving in erosion is not so great as one would naturally in the first instance think. A certain increase in the life of a gun can be gained by

using an efficient gas check, which will make a metallic seal of the gas at the commencement of the travel of the shot and continue it throughout the bore. The advantage of using such a gas check is to lengthen the life of the gun, but it will have much more valuable results if used in conjunction with nitro-cellulose powder than with a powder containing any percentage of nitro-glycerine.

Erosion Results with a Krupp Gun.—As an example of the small erosion in guns when using a nitro-cellulose form of powder, I would refer you to an experiment carried out in a Krupp 6-inch gun, in which—after some 534 rounds, 76 of which were fired with prismatic powder and ballistite—the dimensions of the bore were such that notwithstanding the damage done by the 76 rounds of powder, other than nitro-cellulose, the dimensions of the gun came within the acceptance limit of a new gun. It is only right, however, to add that in this gun the velocities were not very high, being only 2,300 foot-seconds; but even this velocity is higher than that of the majority of 6-inch guns we now have in the Service.

The usual objection put forward to the introduction of a nitro-cellulose powder is that it will not keep on foreign stations with variable climates. This I must state is erroneous; I have results of nitro-cellulose powders stored in some of the hottest climates, and these have proved in every way satisfactory, both chemically and ballistically, when fired in guns. Some of the great German makers have had this powder under various heat tests for many years, and have reported to me their definite opinion that nitro-cellulose powders if properly made, are to be relied upon not to deteriorate any more than cordite and other nitro-glycerine powder when subjected to variable climatic influences.

I have heard it sometimes said abroad that better ballistics can be obtained in a rifle using nitro-glycerine powders as against cartridges made up of nitro-cellulose powders. This belief is unfounded, as I have been able to obtain from rifle cartridges of the smallest size used in Europe higher ballistics with nitro-cellulose powder than with cordite at normal temperatures, say, between 60° and 80° Fahr.

Accuracy of Fire: Telescophic Sights.—I would point out that with modern ships steaming, say, at 20 knots, the variation in distance per second is very great, and therefore from a naval point of view the importance of the flat trajectory cannot be over-rated.

Having generally dealt with the question of high powers produced by powders in guns, I would now devote a few minutes to the consideration of accuracy, and I would at once say that in order to obtain real accuracy under general service conditions, one of the main considerations is the obtaining of a powder which does not cause variations in ballistics, either through change of temperature or damage to the bore of guns. Without this, no artillery, either field or naval, can be seriously relied upon; and this point is seriously considered in all the great countries of Europe. The other main consideration in regard to accuracy is the type of sight made use of with the gun, whether for field or for naval purposes, and I would at once call attention to the great advantage of

using a really good form of telescopic sight, in conjunction with any long-range firing. I am sure that this would tend to lessen the waste of ammunition, and to insure 50 per cent. better accuracy than is the case in artillery not making use of telescopes. I am inclined to think that the old form of sight, in which the tip of the foresight is brought in line with the object through the notch in the back-sight, is a thing of the past. The question of the eye having to focus itself on three different points, and bring them into line, is of necessity difficult, and must tend to great inaccuracy. With a telescope these objections are nearly overcome, although it is difficult and somewhat complicated to make the cross wire of the telescope in focus with the object aimed at. This may be possible with one particular man, but will require adjustment for all different sights. A sight has been invented by Sir Howard Grubb, of Dublin, in which he has been able to devise an arrangement by which an imaginary image, which is practically in focus with the object aimed at, can be brought into the alignment, so that no parallax is caused in the eye, thus rendering the sighting very simple. I am quite sure that the importance of giving special consideration to forms of sight is one of the first duties of the gunner, and cannot have too much attention paid to it.

Providing now the power, constancy in ballistics, and the aim of the gun are correct, we must turn attention to the consideration of the mounting of the gun, either for sea or land service. There is no doubt that the gun, which is designed to move axially with its bore, with as little jump as possible, will give at all angles of elevation the best results, and this is certainly a point which should be considered in the general construction.

In both land and sea service artillery, I am of opinion that this is the reason why the recoil of the gun should be taken by some form of hydraulic cylinder which at the first movement of the gun reduces the strains on the material, allowing the gun to recoil axially, without any important movement of the carriage. Of course, the conditions under which these guns are worked are very different, and I should first like to say a few words on the question of the mountings and general equipments of land service artillery.

Land Service Artillery.—I think one of the great lessons of the present war is the importance of accuracy of fire at long range. I am told by eye-witnesses, that on some occasions our forces were subjected to attack at range of over 11,000 yards, and with some effect. I do not think it is unreasonable to assume that such experience will again be met with in future European wars. It is, therefore, desirable in the construction of field artillery to lay particular stress on the importance of the conditions governing accuracy of fire at these long ranges. In discussing field artillery recently with a great foreign maker, he informed me that his great aim was to construct a field piece which at 10,000 yards would be capable of attaining a very quick rate of fire, and, if necessary, of laying all the rounds within a 10-metre square. He further said that the gun he was experimenting with, after recoiling, returned exactly to the

same position, and, generally speaking, required only the most minute adjustment to the sight in order to bring it into alignment. I myself see no reason why the greatest possible accuracy should not be obtained. I am not, of course, dealing with the question of the bursting of the shell, but of the actual accuracy of range and direction. I do not propose in any way to endeavour to describe the field guns we are at present using in the Transvaal, as the majority of them were designed many years ago, and are well known to most of you.

There must, of course, be much divergence of opinion as to the general conditions to be met in field artillery; but I think, with our present experience, we must all agree that the most important point to be aimed at is accuracy of fire at long ranges in conjunction with a quick rate of fire with the minimum of weight behind the horses. Such conflicting conditions are difficult to obtain, and the general results must necessarily be some form of compromise. I am myself much inclined to favour, for modern field artillery, a heavy type of shrapnel, for the reason that much greater accuracy is obtained at the long ranges, and such a shell admits of the employment of a high-capacity shrapnel. This has the disadvantage of reducing the number of shells carried, which, however, is not important within a limited number, as it only means the necessity of a proportional increase in the number of ammunition wagons; and if we accept the fact that a three-gun battery of modern quick-firing pattern will do the work of the present service six-gun battery, the extra supply of ammunition wagons will not entail an increase in the number of men and horses for the efficient general working of the modern battery in action.

Time Fuses for Shrapnel Shells.—Before dealing with a few general types of modern field guns, I should like to point out that, however good the gun may be, it is of the greatest importance that when the shrapnel reaches its billet, it should burst accurately, and for this reason the time fuse made use of with shrapnels cannot be too well constructed, and should be as efficient as possible. The actual cost of the fuse in field batteries is comparatively small, having regard to the total cost of the equipment, but if these are not efficient, the whole battery is of little value. The greatest attention should thus be paid to the general construction of fuses.

At the present time the best time fuse available is that manufactured by Krupp, of Essen. I have had much experience with these fuses, and have never known one to go wrong. This fuse has such a good name on the Continent that it often happens that countries prefer to purchase ammunition from the German firm of Krupp, rather than from Schneider and other French makers. The small guns used by our troops against the Soudanese were supplied with ammunition fitted with these fuses, and I have heard nothing but good accounts of them. The guns used in the Ashanti operations recently were also supplied with Krupp fuses, and I have been informed that, notwithstanding the serious climatic changes to which they were subjected, not one went wrong. The guns of the American forces used in the Philippines fire only Krupp

fuses; I understand they are still continuing to procure them. I mention this with special regard, not only to the great importance of accuracy of fire, but also to the accuracy of shrapnel effect. The particular fuse I refer to can always be kept screwed in the shell, and all that has to be done in setting it is to turn a ring to the required distance by means of an ordinary tommy. Such an arrangement admits of very rapid time-setting, which, with modern artillery, is absolutely essential.

Quick-Firing Field Guns.—In regard to the general types of Q.F. field carriages at present utilised, I believe I am right in saying that the Maxim field carriage was the first successfully tried in Europe. This carriage is fairly well known, and has been supplied to a great number of countries; but we in England, perhaps, more generally know it as having been the one selected by the C.I.V.'s for use in the Transvaal. In this arrangement of carriage the gun layer sits on a seat attached to the trail, and the recoil is taken by means of a spade, the gun recoiling axially in a cradle, while the energy is absorbed by two hydraulic cylinders placed on each side. I specially mention this construction of carriage, because, notwithstanding the great number of years which have elapsed since it was introduced, all the most modern carriages of the present day are designed on the same lines.

In dealing with the foreign systems of carriages, I would point in the first place to that at present being utilised by the French Army. The French are at the present moment credited with having the most efficient artillery in Europe; it is well known, however, that recently they have changed their pattern, and have now only about 1,000 equipments of the latest form in the Service. It is believed that they have adopted a heavy form of shrapnel, weighing about 8 kilogrammes, and that the gun has a velocity of some 1,700 feet. Notwithstanding this high power, it is capable of easy control, so that there is practically no movement in firing, and the gun is, after recoil, returned to the firing position, so that it can be rapidly relaid by the gunner, who always remains seated on the trail. It is said that in practice the French gunners have obtained a rate of fire of over thirty rounds per minute. I need not say to obtain such a high rate of fire it is necessary to make use of fixed ammunition in which the projectile and metallic cartridge are in one. The gunner who works the mechanism remains during firing on a seat on the opposite side to the gun layer. There is some advantage in the men sitting on the carriage during firing as it increases its weight and keeps it steadier during practice, and the men at the gun have also some protection. The mounting is of the type in which the gun recoils in a cradle, the carriage being fixed rigidly in its position by the spades, one under each wheel, and one at the trail. In order to keep the strains upon the carriage low during fire, the gun is able to recoil through a distance of 1 metre. In order to obtain the most careful accuracy in laying, the gun layer is able to train the gun with its trail and top carriage complete, relatively to the axle through an arc corresponding to 300 metres at 3,000 metres, or 6°. I am not able to show you the actual drawings of the French field gun, but I am able to show several photographs of the equipment generally, and a

diagram representing one of the types of Creusot guns, which embody some of the general principles made use of in the French mounting.

This gun and carriage make use of principles which I am inclined to think will be generally adopted by most countries, as they admit of high power, accuracy of aim, and a quick rate of fire when necessary. I do not wish to give it as my opinion that the details will be by any means followed by other countries, but rather that the general sytsem assists greatly in the realisation of the best conditions of a Q.F. field gun.

I will now pass to another type of French carriage designed by the St. Chamond Company, and which has been tried in connection with our own Horse Artillery, of which I am able to show general representations. I consider this to be a very good type of carriage, enabling general quick-firing conditions to be obtained for moderate weight. The recoil of the carriage is taken by a recoil cylinder fitted under the trail, at the end of which is a spade, the carriage, gun, wheels, etc., recoiling over it. By this means the energy of recoil is absorbed, and after recoil the carriage is brought back to the firing position by means of a spring outside the cylinder. Very good general results have been obtained with this carriage, and the Spanish Government have finally adopted it as being the most suited to the general conditions existing in that country. The gun used in connection with the mounting is one of Vickers-Maxim construction, using fixed ammunition.

The German Government have adopted a much simpler form of mounting than the French, and up the present have preferred only to have a spade at the end of the trail which can be used or not, as the ground determines. I understan d that they have now changed their idea, and are likely in the near future to adopt a mounting so arranged that the gun recoils in the cradle on a fixed carriage.

I would now refer to a carriage of which I understand from the Press a certain number have been introduced into the British Service, namely, that manufactured by Messrs. Ehrhardt, of Dusseldorf. The system utilised is generally similar to the type I have just described, where the gun recoils in a cradle. One of the features of the carriage is that it has a telescopic trail, and when firing the telescopic trail is pulled out so as to have the advantage of the long trail for preventing unsteadiness and jump in the mounting. There are no special features in this mounting to which attention need be specially called, but I would point out that telescopic trails have always been considered objectionable, for the reason that the rough usage on active service is liable to strain such a flimsy construction, and when the gun is in action the mere fact of a rifle shot or shrapnel bullet hitting the thin material of which the tubes are constructed will prevent its being pushed in and out. I am given to understand that on many occasions, both in firing and during transport, the axle has shown weakness, which rather renders the discussion of such a system superfluous, for, however clever the general design of a particular mechanism is, if it will not stand the ordinary rough usage on active service it is of no good to the practical gunner. The

German Government have had this carriage tried, but have no intention whatever of introducing it.

Mountain Gun.—Under the heading of field artillery I will now briefly refer to a type of mountain gun which has done good service to the Empire—the 75-millimetre mountain gun (Vickers-Maxim type). This gun has recently been used with considerable effect in Ashanti with the column operating under the command of Sir James Willcocks, who, I believe, has a high opinion of it, as it never failed to do its work efficiently in this trying climate, notwithstanding the floods, damp, etc., through which it had to go. It is a gun also well known to others who have served in Egypt, having taken part in most of the campaigns in that country. Its great advantage is that it is very light, and can be taken to pieces very rapidly, and carried in parts either on mules or by native bearers. There is nothing complicated about it; and it is not, therefore, liable to get out of order. It is designed on the lines of a modern Q.F. gun and carriage, and consequently its firing effect is very accurate. It fires projectiles of 12½ lbs. and 18 lbs., and can operate at ranges up to 4,500 yards. This gun was used extensively by the Americans in the Philippines, and, notwithstanding the very rough usage it was put to, gave the greatest satisfaction to all concerned. I am glad to say it has now been adopted by His Majesty's Government for most of our Colonial operations, and is being used by our forces against the Chinese. It is not a gun of great velocity, but its curved trajectory using the 18-lb. shell has a searching effect against entrenchments, etc., when direct fire would be but waste of ammunition.

I have not enough time to devote to the consideration of all the various types of ordnance used in the field, but I cannot help urging that the fewer types employed the better, having regard to the difficulties of transport, and other complications in arrangements inevitable to the movements of a large force. The nature of the types selected for each particular campaign must be dependent on the nature of the territory in which the ordnance is to be used, and owing to the extent of our own Empire and the great variety of countries included, it is necessary for us to keep a large reserve of ordnance of every available type, each equipment being located in the particular country in which it is specially adapted and is to be employed.

Automatic Small Arms.—There is one gun, however, which, like the rifle, is employed by every country of the world—namely, fully automatic rifle-calibre guns. The system almost universally adopted is that at present used by His Majesty's Government—namely, the operation of the mechanism by the recoil of the barrel, which is the distinctive characteristic of the Maxim gun. Other systems are to some extent used, such as the Hotchkiss and Colt, in which the waste gases at the muzzle of the gun are used to operate their mechanism; and although this arrangement is not generally employed by the Vickers-Maxim Company, it was originally the invention of Sir Hiram Maxim, who has constructed some very perfect weapons on this system. The strain, however, on the material is rather higher, and for this reason the recoiling barrel system

is preferred. Every country in Europe may be said now to employ a certain number of machine guns.

Heavy Types of Automatic Guns.—I must now pass to the consideration of some other types of automatic guns, and I would first briefly call your attention to the "Pom-pom," of which many are in use at present in South Africa. I have heard many criticisms of this gun; some officers have told me their great advantage is the moral effect they produce, which conclusion I question. Others have assured me that, if the projectiles hit anything alive, they kill it, and of this I have no doubt.

It should always be remembered that the projectiles are one-fifteenth the weight of the field gun projectile, and, therefore, their results cannot in the least be compared. To my mind their great use is for operating with artillery and cavalry, for the protection of the flanks of batteries against cavalry attack, for finding the range for working with outposts, and for the protection of bridges, and other important strategic positions. It is by no means necessary to work these guns in the field as field weapons; they can be carried on pack saddles for special operations where field artillery would be impossible and the strategical results would be most important.

Other automatic guns to which some consideration has lately been given are the 3-pounder, 6-pounder, and 9-pounder guns. To render these guns fully automatic would necessitate certain attachments which, like all mechanism, would be liable to get out of order, and require a certain amount of skilled attention. But I am strongly of opinion that guns of these calibres should be at least semi-automatic, so that after the gun is fired, the action of recoil may open the breech, throw out the empty case, and put the gun in position ready for receiving another charge. The only operation left for the loading gunner is to push home the cartridge which forces the exterior forward, allowing the mechanism to close itself "ready" for firing. Such a mechanism is highly important in the present day, especially on board ship, where in war attack by torpedo-boats and submarine boats must always be expected, and where but a few seconds is given for repelling the attack. Thus a semi-automatic gun of moderate calibre should make all the difference between rendering such attacks disastrous or futile. Such semi-automatic guns are not more complicated than guns having the ordinary form of mechanism, and they have a great advantage. They are as equally applicable for fortress purposes as for ships, and a smaller gun's crew can work them.

Field Howitzers.—Before finally leaving the subject of land service artillery, I should like briefly to refer to the use of howitzers in the field. The special use of these pieces, as most of you know, is for indirect fire where high trajectories are necessary, and where nothing but a large angle of descent of the projectile can prove effective in attack. A large number of such weapons are now in use in the Transvaal, but for general purposes of demonstration I propose to briefly refer to a large 24-centimetre field howitzer used by Austria for the protection of its frontiers. I understand the Austrians have at least seventy of these howitzers in course of manufacture. A good many of them have been already delivered, and

form an invaluable part of the main armament of that country. The special feature of this howitzer is the very heavy shell it uses—of 300 lbs. weight, containing a heavy bursting charge of high explosive. Its use is really for heavy siege work, but it can be got into position and made ready for firing in some twenty minutes from its arrival at the particular spot where it is to be used. The gun, with its cradle, axle, etc., is carried in one load on a four-wheeled wagon; the lower carriage, bed-plate, etc., are carried on a similar arrangement as a second load. It is intended that this howitzer should be brought up by rail to within a short distance of its point of installation, and then dragged by any suitable haulage system to the entrenchment which would be prepared for it beforehand in the ordinary way. The bed-plate is first staked down, and then the carriage is lowered by screws on to the prepared ground, after which the gun with the trail, etc., is run into position on the carriage by suitably inclined wedges. The energy of recoil is taken by a hydraulic cylinder and the gun run forward into the firing position by means of springs, in the usual way. Time does not permit me to deal further with other land service ordnance, as I must pass on to refer to some special naval types of ordnance now in general use.

Sea Service Ordnance.—I will in the first place deal with a type of mounting very generally used by most of the countries of Europe for the purpose of mounting 15-pounder and smaller guns. As the weapons are largely used for resisting torpedo-boat attack, they can hardly be said to enter into the main armament of a battle-ship or cruiser, although they are very useful for gun-boats and the smaller types of ships which are not equipped to fight in the line of battle.

I come now to a type of gun in general use by all countries of the world—namely, the 6-inch Q.F. gun. The first of this type was originally introduced by the late Lord Armstrong, to whose great inventive genius and mechanical skill the world has recently paid a full-hearted and well-merited tribute. As great a number as 11 rounds per minute has been obtained from this gun with velocities in some cases of over 2,800 feet. One of the novel points in connection with the mechanism of this gun is the special form of Vickers' breech screw, which is threaded at varying radii by which, in this particular gun, two-thirds of the circumference are screwed, and only one-third non-screwed. By this design the screw has been lightened to the extent of about 46 per cent. less than the ordinary service breech-screw previously utilised for this gun, and this modified form of screw has now been adopted in many countries of the world, including Great Britain, United States, Japan, and Spain, and, I believe, in many German field guns.

I come next to a form of twin 6-inch mounting, which enables both guns to be fired either separately or simultaneously. In this mounting both guns are elevated and trained together and manipulated from either of the sighting positions. The feature of this mounting is that it admits of the concentration of a very heavy rate of fire from a specially protected gun position. The protection of such gun positions, including the ammunition supply, is now of vital importance in modern ships, and is

receiving much attention from all countries. The powder ammunition supply admits of a continuous rate of supply being carried to the right and left guns, the projectiles being lifted from the shell carrier which revolves round the mounting.

The next gun I should like to refer to is the weapon of 7½-inch calibre, which is now being very generally adopted all over the world. The diagram on the screen represents two of these guns mounted in a barbette and arranged to be supplied with ammunition by hydraulic power. The weight of the projectile for the guns recently constructed for the British Government is 200 lbs., which can be easily lifted by two men. This gun is, therefore, one of the heaviest Q.F. guns now in use. It is capable of firing at the rate of nearly six rounds per minute, which means a collective striking energy of 75,000 foot-tons for every minute the gun is in action. The velocity of the gun, using nitro-cellulose powder, is 3,000 foot-seconds.

I will now come to the heavier types of ordnance of from 9·2-inch to 13-inch calibre, and represent to you the differences existing between those in use by Great Britain and the various Powers. In selecting the various types of mounting, I have chosen those in which different sources of power are utilised, in the hope that discussion may be directed to a consideration of the relative advantages of the different systems. The power by which heavy ordnance, mounted on board ship, should be worked admits of much discussion ; but for my own part I am prepared to vote for hydraulic power for the heaviest ordnance, while I think advantages accrue from the use of electricity for the lighter types. In the very heavy ordnance it is almost necessary to use other power than springs for the running of the gun to the firing position, as the springs employed require to be very heavy, and thus prove cumbersome, necessitating a large port. If, on the other hand, electrical power is utilised, it is necessary to adopt some other system for : 1. Running the gun out. 2. Taking the energy of recoil. If electric power is used for the heavy ordnance, it is generally necessary to embody hydraulic or hydro-pneumatic cylinders in combination for the two operations stated. This involves complication to some extent, and the necessity for greater skill in manipulation. Whatever system is used, I am strongly in favour of having as an alternative mechanical devices operated by hand, in the event of any derangement, especially in action, of the power gear in use.

The first type of 9·2-inch mounting I should like specially to call attention to is one of the latest designed by Krupp, of Essen. The gun is of 40 calibres as against 45 now being used by the British Service. The mounting is elevated and trained by electricity, but the rammer is operated by hydraulic power, this power being brought into the barbette by means of flexible hydraulic piping, the flexible piping doing away with the necessity of elbow-joints, etc. The recoil is taken by a hydraulic cylinder, a portion of the liquid of which is used for compressing air which stores up a portion of the energy, which is afterwards used for running the gun out to the firing position. In normal times it is necessary to lay the gun to a fixed angle for loading.

The ammunition supply is worked electrically, alternative hand-power being also provided. The mounting, from a general point of view, is extremely well designed, and should admit of great efficiency. I will not, however, disguise the fact that, after studying this type of mounting, I am strongly adverse to the complication arising from the use of a combination of electricity, hydraulics, and hydro-pneumatic power.

I will now refer you to the 9·2-inch gun mounted on the Vickers system, being supplied to the Turkish Government. It is worked entirely by hydraulic power, and is very similar in construction to that now being designed for the British Government.

I will not, however, describe this mounting in detail, but proceed to two 12-inch guns mounted on the Vickers system. This is quite a novel type of mounting, admitting of the loading of the gun at any angle of elevation, as well as at any angle of training, so that, during the operation of loading the gun layer is able to accurately sight the two guns, so that immediately the one, or both, are loaded, they can be fired. Arrangements are made that a supply of ammunition is continually being supplied through the ammunition trunk so that the cage which travels on the arc, which is cut concentric with the trunnion of the gun, is always kept filled, so that immediately the gun is fired the cage can be raised into the loading position ready to insert a new charge. This mounting differs from many at present being used in Europe in that, when the ammunition cage is brought up to the gun, it is automatically kept in a fixed position relative to the axis of the gun during the movement of the mounting in elevation. The system generally lends itself to the general quick-loading principles applied to the heaviest types of ordnance. Two rounds per minute from each gun can easily be obtained in actual practice.

Five of our present first-class battle-ships are being fitted with these mountings, rendering their heaviest guns really quick-firing.

I next come to two special mountings of an American type, and I will first refer to that being installed in the "Alabama" class for mounting their 13-inch guns. The great feature of the mounting is that, with the exception of the recoil arrangements, which are hydraulic in combination with heavy spiral springs for running the gun out, no power is used except electric. The rammer is worked by hand-power, and the ammunition cage lifted by electrical power. This mounting only admits of loading at a fixed angle, and is necessarily very heavy owing to the springs required for running the gun out in combination with the heavy cradle necessary for the carrying out of this system. They do not claim to obtain more than one round in two minutes from each of these guns so mounted, as against four which will be obtained from the British mounting.

The mounting of the heavy guns in the "Kearsarge" and "Kentucky" is of special interest. The system is the superimposed turret type of two 8-inch guns above two 13-inch guns. I am told that this arrangement has been successful from an artillery point of view, but it would strike me as being exceedingly heavy and dangerous from the point of view that if one turret is out of action, it means that four of the principal guns of the ship are *hors de combat*.

I would remark in the conclusion of this portion of my lecture referring to heavy artillery for sea service, that I think the Admiralty are to be congratulated on the efficient mountings of artillery in their modern ships, in which I would not only include the mounting admitting of the loading of the gun at any angle of elevation (of the Vickers type), which I consider to be one of the most advanced, but I would also refer to the excellent hydraulic and electric mountings supplied by Messrs. Armstrong, Whitworth & Co., to the British Fleet.

Although I have, perhaps in my lecture, dealt more with equipments supplied by the Vickers-Maxim Company, I would in no way let it be thought that I do not attach the greatest possible importance to the efficient and cleverly worked-out material supplied by the great Newcastle firm, of which that eminent artillerist, Sir Andrew Noble, is the head, and from whom British modern artillery may be said to have received the greatest impulse during the last century.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made :—Vice-Admiral—Sir Cyprian A. G. Bridge, K.C.B., to be Commander-in-Chief in China. Rear-Admirals—A. K. Wilson, C.B., V.C., to be Senior Officer in Command of Channel Squadron ; W. H. May, M.V.O., to be Controller of the Navy. Captains—A. MacLeod to be Director of Naval Ordnance and Torpedoes ; R. W. White to "Anson" ; Sir E. Chichester, Bart., C.B., C.M.G., to Command of Fleet Reserve at Devonport ; D. M'N. Riddel to "Urgent" as Commodore of the second class in charge of Dockyard at Jamaica. Commanders—W. C. Pakenham to "Daphne" ; A. F. Holmes to "Northumberland."

Rear-Admiral A. Moore, C.B., C.M.G., hoisted his flag on board the first-class cruiser "Gibraltar," at Portsmouth on the 18th ult., and left for the Cape on the 20th ult., the ship having commissioned on the 5th ult. The second-class cruiser "Venus," lately returned from the Mediterranean, paid off at Chatham on the 7th ult. ; on the same day the third-class cruiser "Perseus," commissioned at Chatham to relieve the "Racoon," in the East Indies, a somewhat smaller and much older vessel. On the 8th ult. the third-class cruiser "Phœbe" left Portsmouth for Australia to relieve the third-class cruiser "Porpoise," and the first-class gun-boat "Rattler" left Plymouth for the Cape. The second-class cruiser "Cambrian" commissioned on the 5th ult. to relieve the "Flora," a sister-ship, as commodore's ship on the South-East Coast of America, and left on the 23rd ult. for her station. On the 26th ult. the third-class cruiser "Mohawk," arrived at Plymouth from Australia and China, and will pay off at Chatham. The Reserve Squadron broke up on the 28th ult. after its cruise, and the flag-ship "Alexandra" has proceeded to Chatham, where she will pay off, her officers and men turning over to the first-class battle-ship "Revenge."

Launches.—There are several launches to record. The new first-class battle-ship "Russell" was launched on the 19th February from Palmer's shipbuilding yard, Jarrow-on-Tyne. The "Russell" is one of the six battle-ships which were provided for by the naval programme of 1898-99, two of which are building in the public dockyards and four in private yards for His Majesty's Government. She was the first of the six to be launched, and was followed on the 5th ult. by the launch of two of her sisters, the "Montague" at Devonport, and the "Albemarle" at Chatham, while a fourth, the "Duncan," took the water on the 21st ult. from the Thames Shipbuilding Company's Yard at Blackwall. The principal dimensions of these ships are as follows, viz. :—Length between perpendiculars, 405 feet ; beam, 75 feet 6 inches ; draught, 26 feet 6 inches ; displacement, 14,000 tons ; I.H.P., 18,000 ; speed, 19 knots. They are built of steel throughout, and on the longitudinal system ; the stem, sternpost, propeller shaft brackets, and ram of massive strength are formed of steel castings. The hull is divided into 320 water-tight compartments, and there is a double bottom, extending four-fifths of the total length, under the engine and boiler rooms, magazines, and sheel-room spaces. The port and starboard engine-rooms are divided by a middle line water-tight bulkhead extending from the keel to the main deck 10 feet above the load water-line. There are three boiler-rooms, each being a separate water-tight compartment, and containing in all 24 Belleville water-tube boilers. There are

longitudinal water-tight bulkheads at the sides extending throughout the machinery and boiler spaces and sub-divided off by athwartship water-tight bulkheads, forming in all 52 coal bunkers, which act as an additional protection to the engines and boilers. The boats, of which there are 18, including two 56-foot steam pinnaces, are stowed amidships on skid beams. A strong steel derrick, worked by hydraulic power, tested to 36 tons lift, is fitted to the mainmast for lifting them, and the foremast is also fitted with two steel derricks of 10 tons test each, for working of a lighter description. The fore and main lower masts are built of steel, and fitted with military fighting-tops and search-light platforms, with wood top-masts and upper and lower signalling yards. There are two funnels in fore and aft line between the masts.

Protection is afforded by a water-line belt of hard steel armour 7 inches thick, and 14 feet deep in wake of the barbettes, extending for a length of 290 feet to just beyond the foremost barbette, from there to the ram the belt gradually decreases to 3 inches; there are two protective decks, one, the lower, being turtle-backed, 2 inches in thickness, extending from 2 feet 6 inches above the load water-line and sloping down to the lower armour shelf, 5 feet below the water-line; the main deck is of 1-inch steel. The barbettes for the heavy guns, which rise at each end of the armoured citadel, are protected by 11-inch armour, and the casemates for the secondary armament by 6-inch, all of hard steel, on the Krupp process; the hoods for the heavy guns being also of 10-inch hard steel. The foremost conning-tower is of 12-inch hard steel, and the after of 3-inch nickel steel.

The main armament consists of four 50-ton breech-loading guns of 12-inch calibre, with a training of 120° each side of the middle line. The auxiliary armament consists of twelve 6-inch Q.F. guns, each placed in an armoured casemate 6 inches thick. Four of these are on the upper deck, the two forward ones training from the bow to 30° abaft the beam, and the two after ones training from the stern to 30° before the beam. The other eight are mounted on the main deck, the four forward and aft training the same as the guns on the upper deck, and the four amidships have an arc of training of 60° before and abaft the beam. There are in addition twelve 12-pounders, two in the bows and two in the after-quarter on the main deck, and six in the waist of the ship on upper deck, and two on forward shelter deck, the latter being field and boat guns, eight Maxims on shelters and bridges, and six 3-pounders, three in each military fighting top, with four submerged 18-inch torpedo-tubes, two forward and two aft.

The ships will be lighted throughout by electricity, with an installation of about 900 electric lamps, and will also be equipped with six search-lights of 25,000-candle-power each, the dynamos being under protection. Means are so arranged that the ships when in action can fight from either of the two conning-towers. The main propelling engines are twin screw, each set consisting of four cylinders, *i.e.*, one high-pressure 33½ inches diameter, one intermediate pressure 54½ inches diameter, and two low-pressure each 63 inches diameter, the stroke of all being 4 feet. The engines will be run at 120 revolutions per minute. Steam is supplied by 24 boilers of the Bellevile type, the total tube surface being nearly 45,000 square feet. The working pressure of the boilers is 300 lbs. per square inch, reduced at the engines to 250 lbs. per square inch.

On the 21st February, the new first-class armoured cruiser "Good Hope" was launched from the yard of the Fairfield Shipbuilding Company at Govan, on the Clyde. The "Good Hope" belongs to a type of armoured cruiser ordered in the Naval Estimates of 1898-99, four of which were laid down, and are now in course of construction. The other three vessels of the class are the "Drake," which was launched at Pembroke Dockyard on the 5th ult.; the "Leviathan," building at Clydebank; and the "King Alfred" at Barrow. These vessels approximate in size to the "Powerful" and "Terrible," being of 14,100 tons displacement, 500 feet long between perpendiculars, 71 feet beam, and a mean draught of 26 feet. The armament consists of two 9·2 inch, sixteen 6-inch, fourteen 12 pounders, and several

lighter guns. The 9·2-inch guns are mounted in separate barbettes, and the 6-inch guns in casemates, the protection being afforded by 6-inch armour of hard steel. The guns are to be of the most modern type, with many improvements, and it has been stated that the new 7·5-inch will be substituted for the 6-inch eventually, in at least some of the class. Buoyancy and stability will be protected by vertical side armour about 6 inches thick, associated with strong steel decks. In these features the arrangements are to be similar to those of the "Cressy" class and the "Canopus" class, but the bows will be more strongly defended. The steel hulls will be unsheathed. Water-tube boilers of Belleville type will be fitted to give an I.H.P. of 30,000, the measured mile speed in an eight hours' trial is to be 23 knots, and the continuous sea speed in smooth water 21 knots. The capacity of the coal bunkers will be 2,500 tons and 1,250 tons will be carried at the speed trials.

On the same day was also launched from the yard of Messrs. J. Brown & Co., Clydebank, the first-class armoured cruiser "Bacchante." She belongs to the "Cressy" class, of which six are in different stages of completion; all have now been launched with the exception of the "Euryalus," building at Barrow, by the Vickers-Maxim firm, while the "Cressy" has already completed her trials satisfactorily, and the "Sutlej" will shortly commence hers. The dimensions are as follows:—Displacement, 12,000 tons; length, 440 feet; beam, 69 feet 6 inches, with a draught of water 26 feet 3 inches. The armoured belt is 6 inches in thickness, extending in length 230 feet, and in breadth from 6 feet 6 inches above the water-line to 5 feet below it. The engines are to develop 21,000-I.H.P., with a boiler pressure of 300 lbs. to give a speed of 21 knots. The steam will be supplied by thirty Belleville boilers of the latest type. The normal coal capacity is 1,000 tons, but this can be doubled if necessary. The armament will consist of two 9·2-inch guns; twelve 6-inch Q.F., with 17 smaller Q.F. guns, the 9·2-inch and 6-inch guns being protected by 6-inch armour, while the armoured deck will be from 2 to 3 inches in thickness.

On the 6th ult., the "Kent," the first of the "County" class to take the water, was launched. There are ten of these vessels at present under construction. The "Kent" and her sisters will be, in a sense, to the "Blake" and the "Blenheim" what the "Drake" class is to the "Powerful" and "Terrible." The displacement of these vessels is 9,800 tons, and their length 440 feet, the corresponding figures for the "Blake" being 9,000 and 375. But the distinctive advance is shown in the armoured belt, with a maximum thickness of a little over 4 inches of armour, combined with armoured decks, while the 6-inch Q.F. guns are mounted in armoured casemates. The 6-inch guns, fourteen of which comprise the principal armament, are placed, two forward and two aft, on twin mountings inside 4-inch barbettes surmounted by shields of similar thickness, the remainder, ten in number, in casemates on the upper and main decks. Steam will be provided by thirty-one Belleville boilers, giving 22,000-I.H.P, and a speed of 22 knots.

Steam Trials.—The new sloop "Mutine," built and engined by Messrs. Laird, of Birkenhead, has been successfully completing her trials. The results of her thirty hours' trials at three-fourteenths and five-sevenths her full H.P. (1,400-I.H.P.) were as follows:—Three-fourteenths H.P.—Draught of water, forward 10 feet 2 inches, aft 13 feet; pressure of steam, in boilers 170·2 lbs., in engine-room 168·4 lbs; vacuum, 27·15 inches; revolutions, 122·1 per minute; I.H.P., high 110·2, intermediate 84·1, low 135·5—total, 329·8; coal consumption, 1·87 lbs. per I.H.P. per hour; speed, 8·1 knots. Five-sevenths H.P.—Draught of water, forward 10 feet 1 inch, aft 12 feet 11 inches; pressure of steam, in boilers 198·7 lbs., ditto in engine-room 195·5 lbs.; vacuum, 28·08 inches; revolutions, 181·3 per minute; I.H.P., high 347·9, intermediate 291·9, low 401·1—total, 1,040·9-I.H.P; coal consumption, 1·72 lbs. per I.H.P. per hour; speed, 12·2 knots. The results of her eight hours' full-speed trial were as follows:—Draught of water, forward 9 feet 10½ inches, aft 12 feet 11 inches; pressure of steam, in boilers 225·2 lbs., ditto in engine-room 215·6 lbs.; air pressure, ·17 inch; vacuum, 26·4 inches; revolutions, 206·5 per minute; I.H.P., high 483·9, intermediate 428·8, low 577·9—total, 1,490·6-I.H.P.; speed by the patent log, 14·55

knots; speed on the measured mile, 13·74 knots. The machinery and Belleville boilers worked satisfactorily throughout. The contract with Laird Brothers, of Birkenhead, specified 1,490-I.H.P.

The new torpedo-boat destroyer "Myrmidon," built and engined by Palmer's Shipbuilding Company at Jarrow-on-Tyne, has successfully concluded her trials. At her first trial, with 6,623-I.H.P. and 379·4 revolutions, she averaged a speed of 30·134 knots. On that occasion the air pressure was 2·97 inches, and the coal consumption worked out at 2·196 lbs. per unit of power per hour. This being three-tenths of a pound under the standard consumption allowed by the Admiralty, she was entitled to carry 6 tons less than her normal load, but, as the speed trial had to be followed by the stopping, starting, and steering trials, the contractors availed themselves of only half the allowance. With 6,303-I.H.P. and 377·2 revolutions, the mean speed of the three hours was 30·229, with an air pressure of only 2·7 inches in the stoke-holes. The next run over the mile with wind and tide gave a speed of 32·086, while the mean of the six runs over the mile gave a speed of 30·521. Two other boats of similar description are shortly to be delivered at Portsmouth by the same firm.

A Coaling Record.—The five battle-ships constituting the Portsmouth division of the Channel Squadron, before leaving on their late cruise, completed coaling under the new conditions that have been introduced. As the whole of the ships were practically without coal it was considered desirable to ascertain how rapidly, with the full use of all availabe appliances, a war-ship could be stored, and it has been clearly demonstrated that in the winter any ship demanding anything up to 1,500 tons, or even more, can be supplied during one day's daylight. To effect this three cranes were kept at work on the shore side, and on the water side were two vessels with two Temperley transporters in each. The question, therefore, arose whether the crew could stow the coal as rapidly as it could be shipped. It was further determined to give, as far as possible, each ship the same chance, but this condition could not be fully observed, for while four of the vessels coaled in daylight, the "Prince George" had three hours of artificial light—namely, from 5.30 to 8.30 p.m. In each case, however, every detail of the operation was carried out by the ship's companies, the only outside assistance being rendered by the dockyardmen who worked the winches on shore. The work even to bringing the lighters alongside and the running of the coal to the cranes was performed entirely by the crews. So keen was the competition that not only lieutenants, but chaplains, surgeons, and paymasters throw themselves into the work, and wheeled their loads with the energy and rapidity of trained stokers. The following is a return of the operations on the five ships:—

Ship.	Date.	Tons shipped.	Working hours.	Average Tons per hour.
Hannibal	Jan. 14	943	5h. 45 m.	170
Prince George	Jan. 25	1,220	6h. 30 m.	187·7
Resolution	Jan. 28	1,215	7h. 10 m.	169·5
Majestic	Feb. 4	1,230	5h. 50 m.	200·3
Mars	Feb. 6	1,070	5h. 15 m.	203·8

Up to 4 o'clock in the afternoon, or about an hour before coaling ceased, the "Mars" had averaged 218 tons an hour, but at this point the fuel accumulated on deck, the men below being unable to trim it as rapidly as it was sent down; and though this broke down her average she for the present holds the record so far as the Portsmouth division of the Channel Squadron is concerned. It should be mentioned that the competition was instituted without any advice or recommendation from the Admiralty, but in order that Commander Heathcote, who has relieved the dockyard store officer of the responsibility, might obtain information for his guidance in the event of an emergency arising.

Liquid Fuel in Steamers.—The steamship "Cowrie," of the Shell Transport and Trading Company, lately steamed all the way from Koetei, in Borneo, to London—9,250 miles—using nothing but liquid fuel, and the boilers supplying

the steam for the pumps that are now discharging the cargo are fired by the same material. The oil is not burnt by the aid of a thin layer of incandescent coal as is the case in some systems, but is pulverised or reduced to spray by means of a steam jet at the furnace door, where it is delivered from service tanks above the boilers. The "Cowrie" was formerly fired with coal, and her conversion to liquid fuel has been attempted with advantageous results. Her complement of stokers has been reduced to 6, as against 16 necessary with coal, and her speed has, at the same time, been slightly improved. Moreover, the change has effected an important saving in bunker space, for her consumption of oil on this voyage was only 22 tons a day, whereas her daily consumption of coal used to be 35 tons, and a ton of oil is calculated to occupy only 34 cubic feet, against 45 feet required for coal. Oil, too, can be carried in the water-ballast tanks, and can also be taken on board much more quickly than coal—on a recent occasion 300 tons were pumped into a German steamer in one hour. The oil yielded by the Borneo fields forms an excellent fuel when used just as it comes from the ground, and is said to be superseding both the Russian and American products in the Far East, where it is extensively used for fuel in steamers—*e.g.*, the Hamburg-American boats engaged in the Eastern trade. To give some idea of its cost, it may be mentioned that, according to the terms of a recent contract, which need not be specified exactly, it is to be delivered at the price of 30s. a ton at Signapore and Hong-Kong, 32s. 6d. at Shanghai, 35s. in Japan and Colombo, and 50s. at Suez. The "Cowrie" brought from Borneo over 6,000 tons of solar oil, the greater part of which is destined to be used by the Gas Light and Coke Company for the production of oil gas for enrichment purposes, and it is an interesting fact that the vessel (or one like her) will be bunkered with the refuse that remains after the oil has been utilised in this manner.

Non-Effectives.—By direction of the Admiralty the following battle-ships and cruisers have been placed on the non-effective list of the Royal Navy:—The "Audacious," 18, third-class battle-ship, 6,010 tons, 3,300-H.P., built in 1870 by Messrs. Napier, of Glasgow, at a cost of £256,291; the "Invincible," 16, third-class ship, 6,010 tons, 3,300-H.P., also built by Messrs. Napier in 1870, at a cost of £249,203; the "Triumph," 14, third-class battle-ship, 6,640 tons, 3,500-H.P., built by Messrs. Palmer, of Jarrow, in 1873, at a cost of £268,561; the "Achilles," 16, first-class armoured cruiser, 9,820 tons, 4,000-H.P., built at Chatham Dockyard in 1864 at a cost of £469,572; the "Active," 12, second-class cruiser, 3,080 tons, 2,400-H.P., built by the Thames Shipbuilding Company in 1874, at a cost of £132,817; the "Raleigh," 14, second-class cruiser, 5,200 tons, 4,200-H.P., built at Chatham Dockyard in 1869, at a cost of £210,234; the "Volage," 12, second-class cruiser, 3,080 tons, 2,400-H.P., built by the Thames Shipbuilding Company in 1869, at a cost of £132,817; the "Hydra," 4, coast-defence ship, 3,560 tons, 1,200-H.P., built by Messrs. Elder, of Glasgow, in 1869, at a cost of £144,333; and the "Scorpion," 4, coast-defence ship, 2,750 tons, 1,000-H.P., built by Messrs. Laird, of Birkenhead, in 1865, at a cost of £111,614.—*Times* and *Naval and Military Record.*

FRANCE.—The following are the principal appointments which have been made:—Rear-Admiral—E. A Marquer for service at Ministry of Marine. Capitaines de Vaisseau—A. D. Somborn to "Tage"; L. Barnaud to "Protet" and command of Pacific Naval Division; J. L. N. Le Pord to "Chateaurenault." Capitaines de Frégate—F. O. Le Cannelier to "Rance"; J. F. Clément to "Lévrier"; M. A. Gros to "Lavoisier"; H. G. Büchard to "Pourvoyer"; E. E. Gervais to "Condor"; J. B. E. Cauvet to "Calédonien."—*Journal Officiel de la République Française.*

The cruiser division of the Northern Squadron, under Rear-Admiral Gourdon, has been carrying out long-distance signal practice. The cruiser division of the

Mediterranean Squadron, commanded by Rear-Admiral Caillard, has returned to Toulon from the coast of Syria and Greece.

Torpedo-boat No. 91 had the misfortune to touch a rock near Bréhat and sank before she could be put into dock. The crew was saved, and operations for raising her have commenced.

The following changes take place during the second quarter of 1901 :—

The destroyers "Pique" and "Épée" will join the Mediterranean Squadron after completing their trials at Cherbourg.

The Northern Squadron completed with full crews on 1st April. The first-class battle-ship "Iéna" and the first-class cruiser "Chateaurenault" will join the Northern Squadron.

The second-class cruiser "Cécille" will replace the first-class cruiser "Tage" in the Atlantic Division.

The first-class cruiser "D'Entrecasteaux" will rejoin the fleet in Chinese waters as soon as her defective guns have been made good; while the second-class cruiser "Jean Bart," from China, will be placed in reserve at Lorient.

The gun-boat "Phlégéthon" will commission at Cherbourg and be attached to the division at Tunis.

Launches.—The armoured-cruiser "Desaix" was launched at St. Nazaire on 21st March. Being destined for service on distant stations, she is sheathed with wood and coppered under water. Her displacement is 7,700 tons; length 130 metres (426 feet); beam, 17·50 metres (56 feet); draught of water, 7·42 metres (23 feet). She has three propellers driven by vertical triple-expansion engines. Her estimated speed is 21 knots, and she can carry 1,200 tons of coal, giving a radius of action of 8,800 miles at 10 knots, and 1,650 miles at full speed. She has an armoured water-line belt 100 millimetres (3·9-inch) thick, and carries ten 164-millimetre (6·4-inch), ten 47-millimetre (1·8-inch), and six 37-millimetre (1·4-inch) guns, as well as two torpedo-discharges. Her complement will be 32 officers and 499 men, and her cost is 19,068,975 francs (£762,759).

The sea-going torpedo-boat "Borel" was launched at Bordeaux, and the "Simoun" at Graville on 23rd March. They have a displacement of 162 tons and a speed of 29 to 30 knots.

The aviso-transport "Vaucluse," probably the last vessel to be built of wood, will be launched at Rochefort on 17th April. Her completion has been several times suspended. Her displacement is 1,613 tons; length, 64 metres; beam, 10·50 metres. She will carry ten guns, four of which are Q.F., and has a complement of 4 officers and 114 men.

The New Building Programme.—The new programme of construction is to be pushed forward with all possible despatch, orders having been given for the commencement of two battle-ships, one armoured cruiser, two destroyers, and three submarine boats in the Government dockyards, and eight destroyers and eleven torpedo-boats by contract. The two battle-ships are to be named the "République" and "Patrie," and their dimensions exceed by 2,000 tons the "Suffren," hitherto the largest French battle-ship laid down. The "République" is to be built at Brest, and the "Patrie" at one of the private yards. Their displacement is to be 14,865 tons; length, 133·80 metres (436 feet); beam, 24·35 metres (79 feet); draught of water, 8·37 metres (26½ feet). They will have three propellers, triple-expansion engines, and water-tube boilers, giving 17,475-H.P., the estimated speed being 18 knots. They will be able to carry 1,825 tons of coal, giving a radius of action of 8,390 miles at 10 knots, and 1,880 miles at full speed. Their armament will comprise four 305-millimetre (12-inch) guns in pairs in two turrets, one forward and one aft, eighteen 164-millimetre (6·4-inch) guns, of which twelve will be in six turrets in pairs, and six in armoured casemates; twenty-six 47-millimetre (1·8-inch) and two 37-millimetre (1·4-inch) guns, and five torpedo-tubes, two of which will be submerged. There will be a complete armoured belt 300 millimetres (11·8 inches) thick, tapering forward to 80 millimetres (3·1 inches) thick, and armoured decks respectively 70 millimetres (2·7 inches) and 55 millimetres (1·9 inches) thick. The main turrets will be 320-millimetre (12·6-inch)

armour, and the smaller ones 140-millimetre (5·5-inch). The complement will be 42 officers and 751 men, and the cost of each vessel 35,000,000 francs (£1,400,000).

The armoured-cruiser will be named the "Victor Hugo" in continuation of the class named after eminent Frenchmen like the "Jules Ferry" and "Léon Gambetta," already commenced. Her displacement is to be 12,550 tons, length 146·50 metres (480 feet), beam 21·40 metres (69 feet). She will carry four 194-millimetre (7·6-inch) guns in pairs in two turrets forward and aft, and sixteen 164-millimetre (6·4-inch) guns, twelve of which will be in pairs in six turrets and four in armoured casemates; and twenty-two 47-millimetre (1·8-inch) and two 37-millimetre (1·4-inch) guns, and five torpedo-discharges, two of which will be submerged. She will have an armoured water-line belt 170 millimetres (6·6 inches) thick, and two armoured decks. Her H.P. will be 27,500 and speed 22 knots, radius of action 7,500 miles at 10 knots and 1,590 miles at full speed. Her complement is 38 officers and 690 men; she will cost 29,484,500 francs (£1,179,380), and is to be built at Toulon.

The ten destroyers are all of the same type, having a displacement of 303 tons and a speed of 28 knots, and being armed with one 65-millimetre (2·5-inch) and six 47-millimetre (1·8-inch) guns, and two above-water torpedo-discharges. Their complement will be 4 officers and 44 men. The two to be constructed in the arsenal at Rochefort are to be named the "Sabre" and "Francisque." The eight to be built by contract are named "Dard," "Baleste," "Mousqueton," "Arc," "Pistolet," "Bélier," "Catapulte," and "Bombarde." They will cost 1,700,000 francs (£68,000) each.

The eleven torpedo-boats to be built by private firms have a displacement of 87 tons, speed 24 knots, and will be numbered 266 to 276.

Three submarine boats are already under construction; they are of different types for experiment, and are in excess of the programme; these will be followed shortly by twenty submarine boats of a type already nearly decided on; the number of these vessels will be, therefore, more than doubled, fourteen being already built or in course of construction, four of which have completed their trials, namely, the "Gymnote," "Gustave Zédé," "Morse," and "Narval"; two more, the "Français" and "Algérien," nearly complete, and eight more ordered by M. de Lanessan; these are four improved "Morse," building at Rochefort, named "Farfadet," "Gnome," "Korrigan," and "Lutin," and four "Narvals" at Cherbourg named "Sirène," "Triton," "Silure," and "Espadon." Thus, in a few months, the flotilla of submarine boats will number no fewer than thirty-seven of these small vessels.—*Le Temps* and *Le Yacht*.

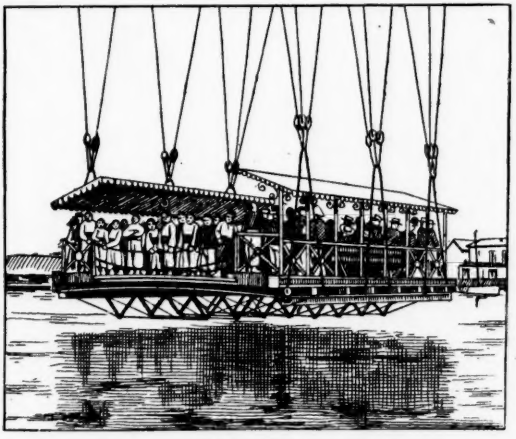
The New Ferry-Bridge at Bizerta.—The crossing of channels much frequented by shipping is a matter which has given no little concern to engineers. The solution of the problem is attended either with a temporary interruption of traffic or with no interruption at all. In other words, ferries or bridges must be employed. Floating ferries are the more defective, owing to their limited capacity, their liability to interruption by the action of tides, storms, fogs. They can be used only when the traffic along and across the waterway is small.

A system of bridge-ferriage has, however, been devised by F. Arnodin and De Palacio, which, in the last few years, has found increasing favour in the eyes of engineers. The system, it is claimed, leaves the channel entirely clear at all hours, requires no long and steep approaches, and transports persons and goods without change of level.

The Arnodin-Palacio ferry consists primarily of a straight, horizontal railway crossing the channel at a sufficient height to permit tall-masted vessels to pass at high tide. Evidently the type of structure most suitable for this railway is the suspension-bridge, because it is strong enough to sustain the load to be transported, because intermediate supports are unnecessary, and because but little resisting surface is offered to the wind. Messrs. Arnodin and Palacio therefore employ only stiffened suspension bridges of a special type with removable parts, supported on skeleton or built towers, with mooring cables anchored to shore and

designed to take up the strains produced by the bridge on the towers. The platform of the bridge carries two lines of rails, on which a carrier travels by means of wheels, varying in number with the weight to be carried. From the carrier a platform or car is suspended by means of wire stirrups, at the level of the quays on each side of the channel. The carrier comprises a frame suspended below the level of the rails, and moves from one end to the other of the bridge. The car or ferry platform is decked, the suspending wires being arranged in triangles, so as to secure the necessary stiffness and to prevent oscillation. The carrier is driven by motive power of any kind. The carrier-wheels are arranged in pairs working on parallel rails placed closely together, forming each track, by which arrangement the carrier cannot leave the track.

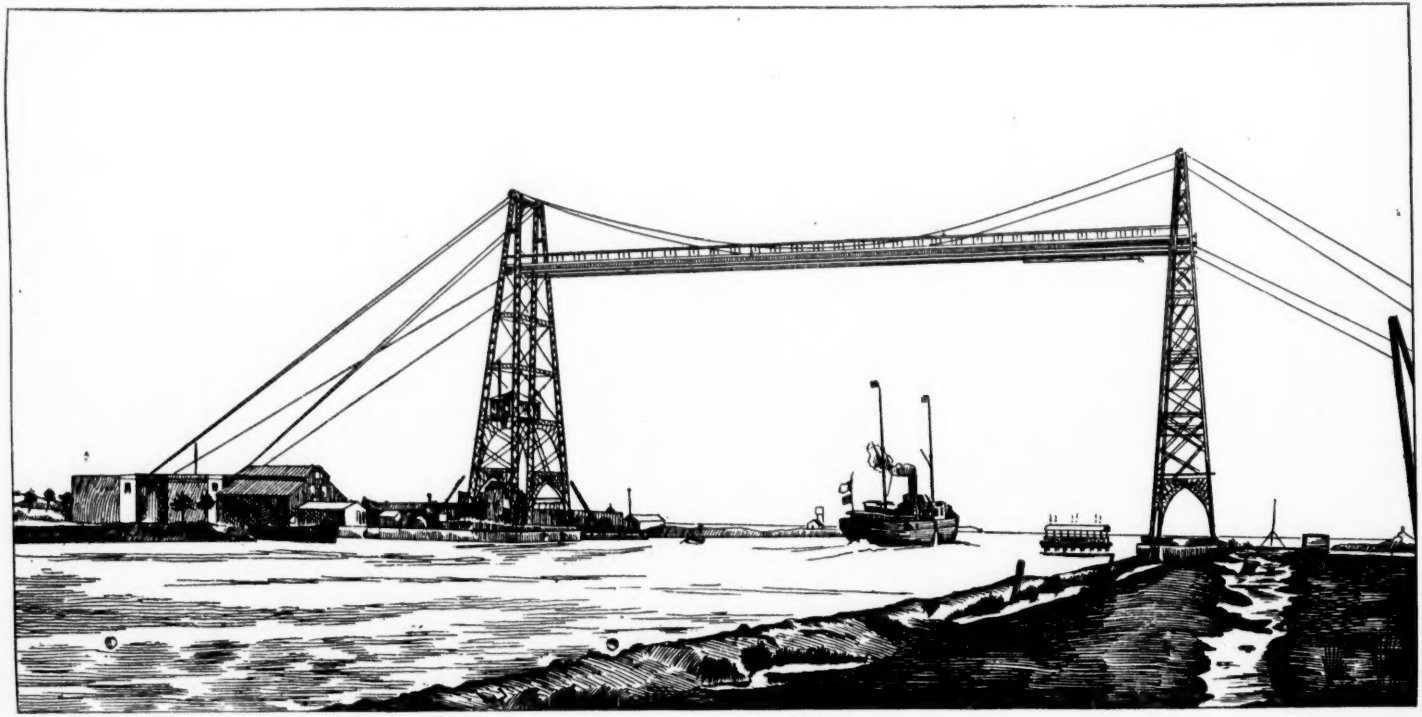
The ferry platform or car can be designed to meet the most varied conditions of traffic. The bridge itself, constructed so as to comprise only those parts indispensable to strength, is provided with a framework of latticed girders well braced together. On each side of the platform thus formed are light foot-bridges for repairing and lubricating the moving parts.



THE CAR.

The most recent application of the Arnodin-Palacio ferry-bridge system is to be found at Bizerta. The deep-water canal which connects the magnificent lake of Bizerta with the Mediterranean Sea cuts through the road which leads from Bizerta to Tunis. In order that traffic might not suffer from this destruction of the road, it was necessary to provide some means for bridging the canal. At first it was decided to employ row-boats, but the traffic was so great that a steam ferry-boat was constructed in 1892. Although the Mediterranean has no appreciable tides, there are, nevertheless, ebb and flood currents, which vary with the condition of the sea. Against these currents the steam ferry proved ineffective when they were reinforced by the wind; for which reason the ferry-boat was guided to the slip on either shore by a heavy steel cable. This arrangement would no doubt have proved satisfactory enough under ordinary circumstances; but there was constant danger of the cable's blocking the passage of a ship. It was therefore decided to build a ferry-bridge after the system of Arnodin and Palacio.

The rails, in the Bizerta structure, are supported by the girders of a metallic platform. The cables whereby the platform is suspended are eight in number, anchored to the top of the towers. The strain on the towers is taken up by eight



THE FERRY-BRIDGE AT BIZERTA.

additional cables (four on each side of the channel), securely anchored in masonry on shore. Forty smaller cables extend from the towers and assist the main cables in supporting the rail platform. The distance between the towers is exactly equal to the width of the canal, namely, 109 metres (357·5 feet).

The platform is supported at a height of 45 metres (147·6 feet) above the quays. The car is 10 metres (32·8 feet) long, and 7·5 metres (24·6 feet) wide. This car, together with the cables and carrier by which it is supported, weighs (unloaded) 24 tons, and has a carrying capacity of over 56 tons. Sufficient room is be found in the car for two large and four small carriages, together with 90 foot passengers, or for 270 passengers without any vehicles. The carrier is propelled by a steam engine placed above the great arch in the tower on the left bank. The steam-engine drives a drum, about which a steel cable is wound, passing over pulleys at each end of the railway, and secured to the carrier. Although the engine is nominally of 15-H.P., a boiler of only 10-H.P. is used, since the ferry is operated only intermittently. The car crosses the canal in about 45 seconds.

The ferry-bridge was begun in January, 1897, and opened for traffic on June 12th, 1898. The total cost was 560,000 francs (£22,400).—*L'Illustration.*

UNITED STATES.—*The Armoured Cruisers of the "California" class.*—In the January number of the JOURNAL we gave a full description of these vessels, but as we are now able to give the profile and deck plans of these ships, we will briefly repeat their principal characteristics. Length, 502 feet; beam, 70 feet; displacement, 13,800 tons, with a mean draught of 24 feet 6 inches. The 7-foot 6-inch water-line belt extends the whole length of the vessel. For about 244 feet abreast of the engine and boilers it consists of 6-inch armour for 4½ feet from the upper edge, after which it tapers to 5 inches at the lower edge. At the bow and stern it is 3½ inches thick. Above the main belt there will be 5-inch armour for a length of 232 feet extending vertically to the main deck. Transverse armour 4 inches thick will be worked at the ends of the 5-inch side armour, thus forming a central casemate for ten 6-inch guns. The main belt will be 387 tons; the taper belt at the ends, 261 tons; the upper and lower casemate side-armour, 674 tons; and the transverse casemate armour, 220 tons. With other armour, bolts, backing, and 100 tons of cellulose, the total weight devoted to protection will be brought up to 2,219 tons.

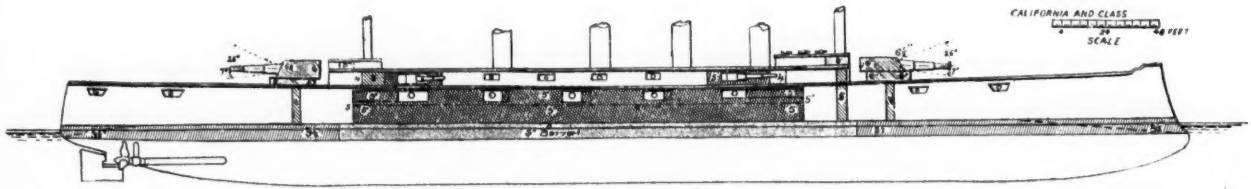
The rate of supply of ammunition to the 8-inch turret hoists is one round every 50 seconds; and for the 6-inch guns three complete rounds a minute. The weights of the armament are as follows:—

	Tons.
Four 8-inch guns...	72·0
„ „ mounts	43·2
Fourteen 6-inch guns	114·2
„ „ mounts	70·0
„ „ shields	23·1
Eighteen 14-pounder guns and mounts	45·0
Twelve 3-pounder guns and mounts	8·5
Torpedo-outfit	24·0

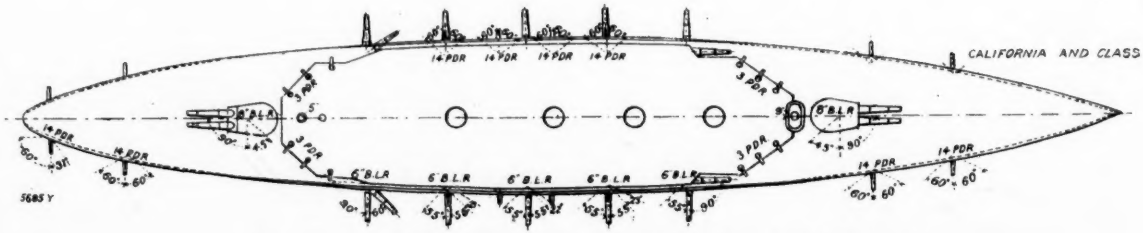
Other items of armament bring the total weight to 407·5 tons.

The weight of ammunition, etc., will be as follows:—

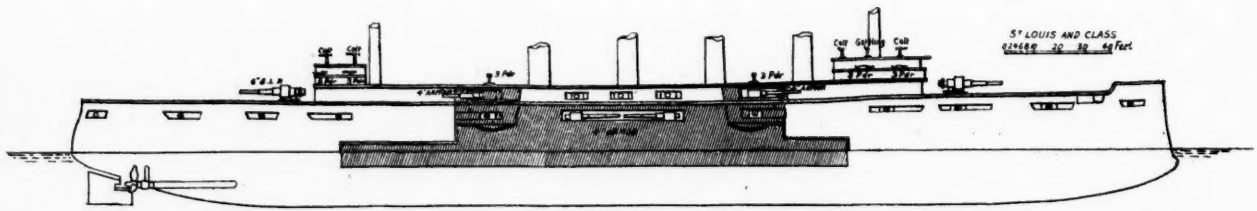
	Tons.
Five hundred rounds 8-inch ammunition complete	91·5
Two thousand eight hundred rounds 6-inch ammunition complete	227·5
Four thousand five hundred rounds 14-pounder ammunition complete	51·7
Six thousand rounds 3-pounder ammunition complete ...	22·4
All other ammunition	18·8
Store and outfits	20·0
Total...	432·0



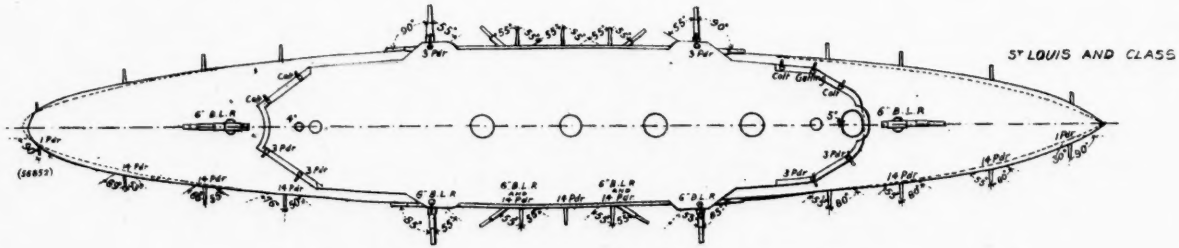
PROFILE OF FIRST-CLASS ARMOURED CRUISERS OF "CALIFORNIA" CLASS SHOWING THICKNESS AND DISPOSITION OF ARMOUR.



DECK PLAN OF "CALIFORNIA" CLASS SHOWING DISPOSITION OF ARMAMENT.



PROFILE OF FIRST-CLASS PROTECTED CRUISERS OF "ST. LOUIS" CLASS SHOWING THICKNESS AND DISPOSITION OF ARMOUR.



DECK PLAN OF "ST. LOUIS" SHOWING DISPOSITION OF ARMAMENT.

The propelling machinery will consist of two sets of four-cylinder triple-expansion engines to drive the twin screws; the combined H.P. being 23,000, or 2,000-H.P. less than the legend power of the "Powerful" and "Terrible," and 7,000-H.P. less than the more recent armoured cruisers of the "Drake" class. These latter vessels are about the same length as the American ships, but have a beam of 71 feet and a displacement of 14,100 tons. The "Drake" is designed for 23 knots, and carries two 9·2-inch and sixteen 6-inch guns, besides guns of a smaller nature. She has also 6-inch side armour and 12-inch to 12½-inch armour for bulkheads and gun positions. The steam pressure in the engines of the "California" and "Maryland" and the four sister ships will be 250 lbs., and the revolutions 120 per minute. There will be 30 water-tube boilers, with approximately 1,590 square feet of grate, and about 68,000 square feet of heating surface. The ships are to have a speed of not less than 22 knots.

The Protected Cruisers of the "St. Louis" Class.—The protected cruisers, to be named the "St. Louis," "Milwaukee," and "Charleston" (the latter to continue the name of the 3,700-ton vessel wrecked 2nd November, 1899, off Kamiguin Island in the Philippine group), compare favourably with their class in other Navies. In fact, so closely do they approach the type of second-class armoured cruisers that they might easily be mistaken for such. In an engagement they would prove themselves a match for some of the armoured cruisers of other Navies.

The act authorising the "St. Louis" class states that these vessels shall carry "the most powerful ordnance for vessels of their class, and have the highest speed compatible with good cruising qualities and great radius of action"; all these qualifications have been embodied in the design for these vessels. The general appearance of these cruisers suggests that trite quotation: "A thing of beauty is a joy for ever." "Beauty" and "joy" applied to these vessels means easy lines, graceful exterior, speed, and the ability to sustain that prestige upon the sea which has been maintained by the Navy of the Republic since its origin.

The main deck of these cruisers is supplemented amidships with a covered superstructure, within which are located four 6-inch rapid-fire guns and six 14-pounder rapid-fire guns; outside the superstructure are two more 6-inch rapid-fire guns, located on the centre line, one forward and the other aft. Located on the gun-deck is the greater portion of the battery, consisting of eight 6-inch rapid-fire guns, twelve 14-pounder rapid-fire guns, and four 1-pounder rapid-fire guns. Sixteen rapid-fire guns are stationed on the superstructure deck and bridges, and the remainder of the battery is located in the fighting tops of the two military masts. Additional platforms are built upon the masts to accommodate the two search-lights. Electric ammunition hoists are designed to supply the guns with the greatest rapidity, making it possible to hurl against an enemy a broadside of about 12 tons of metal per minute.

The four lofty smokestacks, extending to a height of 76 feet 6 inches above the normal load water-line, provide draught for sixteen straight water-tubular boilers located in four water-tight compartments, which, together with the engines, are protected by the side armour, sloping-deck armour, and a 12-foot coal bunker.

The inner bottom of these vessels extends to the under side of the protective deck; above the protective deck a cellulose cofferdam, 30 inches wide and 41 inches above the normal load water-line, extends throughout the length of the vessel.

In the construction and equipment of the "St. Louis" class, as small a quantity as possible of wood is to be used, and wherever it is used it will be electric fire-proofed. Each vessel of this class is fitted to accommodate a flag officer and staff in conjunction with the regular complement. In commission the number of officers will be 39 and the crew will number 525 men, for which are provided 16 boats, ranging from a 36-foot steam cutter to a 16-foot dinghy, and in addition to these two 12-foot punts and two life-rafts will be carried. These boats are stowed in chocks on the superstructure deck and swung out by four cranes

Comparative table of the new United States armoured cruisers of the "California" and "St. Louis" classes and the "Essex" class (Great Britain):—

	United States.			Great Britain.
	"California" (Sheathed).	"Maryland" (Not Sheathed).	"St. Louis."	"Essex" Class.
Length on load water-line	502 ft. 0 in.	502 ft. 0 in.	424 ft. 0 in.	410 ft.
,, over all	504 ,, 9 ,,	504 ,, 9 ,,	426 ,, 6 ,,	—
Breadth moulded	69 ,, 4 ,,	69 ,, 4 ,,	65 ,, 2 ,,	—
,, extreme	70 ,, 0 ,,	69 ,, 6 ,,	66 ,, 0 ,,	66 ft.
Draught, mean	24 ,, 6 ,,	24 ,, 6 ,,	23 ,, 6 ,,	24 ft. 6 in.
Corresponding displacement	13,800	13,400	9,700, with 650 tons coal.	9,800 tons.
Freeboard, forward	23 ft. 0 in.	23 ft. 0 in.	21 ft. 0 in.	—
,, aft	21 ,, 6 ,,	21 ,, 6 ,,	19 ,, 11 ,,	—
,, amidships	18 ,, 0 ,,	18 ,, 0 ,,	17 ,, 8 ,,	—
Speed in knots	22	22	22	23
I.H.P., total	23,000	23,000	21,000	22,000
Area amidship section, square feet	1,607·2	1,575·0	1,445·6	—
Area load water-plane, square feet	24,500	24,020	18,638	—
Tons per inch immersion (load water-line)	58·31	57·7	44·5	—
Moment to alter trim 1 inch, ft-tons	1,490·5	1,470	980	—
Wetted surface, square feet	42,843	42,430	23,000	—
Rudder area, square feet	259·4	259·4	200	—
Maximum helm angle, degrees	38	38	38	—
Mean draught (with all stores, provisions, ammunition, and coal)	26·6 (1,900 tons coal).	26·6 (1,900 tons coal).	25·6 (1,500 tons coal).	—
Corresponding displacement, tons	15,200	14,875	10,772	—
Armament.				
Main battery	Four 8-in. B.L.R. Fourteen 6- ,, ,,		Fourteen 6-in. Q.F.	Four 6-in. Q.F. guns in turrets. Ten 6-in. Q.F. guns in casemates.
Secondary battery	Eighteen 14-pdr. Q.F. guns Twelve 3-pdr. Q.F. guns Four 1-pdr. automatic guns ,, 1-pdr. Q.F. guns Two machine guns Six Colt automatic guns Two 3-in. Q.F. guns		Eighteen 14-pdr. Q.F. guns. Twelve 3-pdr. semi-automatic Four 1-pdr. automatic. Eight 1-pdr. Q.F. guns. Two 3-in. field guns. Two machine guns. Eight automatic.	Ten 12-pdr. Q.F. guns. Three 3-pdr. Q.F. guns. Eight machine guns.
Torpedo-tubes	Two submerged.		—	—
Armour.				
Water-line belt thickness amidships: Top	6-in.		4-in.	4 in., tapering to 2 in. at bow.
Bottom	5-in.			
Height of upper edge above normal water level	2 ft. 4 in.		3 ft. 3 in.	—
Total depth of belt	7 ,, 6 ,,		7 ,, 6 ,,	—
Thickness of Casemate: Upper	5-in.		4 in.	—
Lower	5-in., tranverse 4-in.			
Gun protection	5-in.		4 ,,	4 in.
Turret, maximum and minimum thickness	8-in. gun, 6½-in. and 6-in.		—	—
Barbette	8-in. gun, 6-in.		—	—
Protective deck: Slopes	4-in.		3 ,,	Two decks, 1¼ in. and ¾ in.
Flat	1½ ,,		2 ,,	—
Conning-tower	9- ,,		5 ,,	—
Signal tower	5- ,,		4 ,,	—
Estimated Weights.				
Hull and fitting, including wood backing, sheathing, and copper-ing, protective deck plating, etc.	7,441·56 tons.	7,041·56 tons.	5345·8 tons.	—
Armour and bolts	2,019		755	—
Armament and ammunition, full supply	839·5 tons.		643·1 tons.	—
Equipment, miscellaneous stores and water, full supply	626 ,,		488·6 ,,	—
Propelling machinery and water	2,135 ,,		1,900 ,,	—
Normal coal	900 ,,		650 ,,	800 tons.
Bunker capacity	2,000 ,,		1,500 ,,	1,600 ,,
Officers, crew, and effects	89·65 ,,		73·6 ,,	—

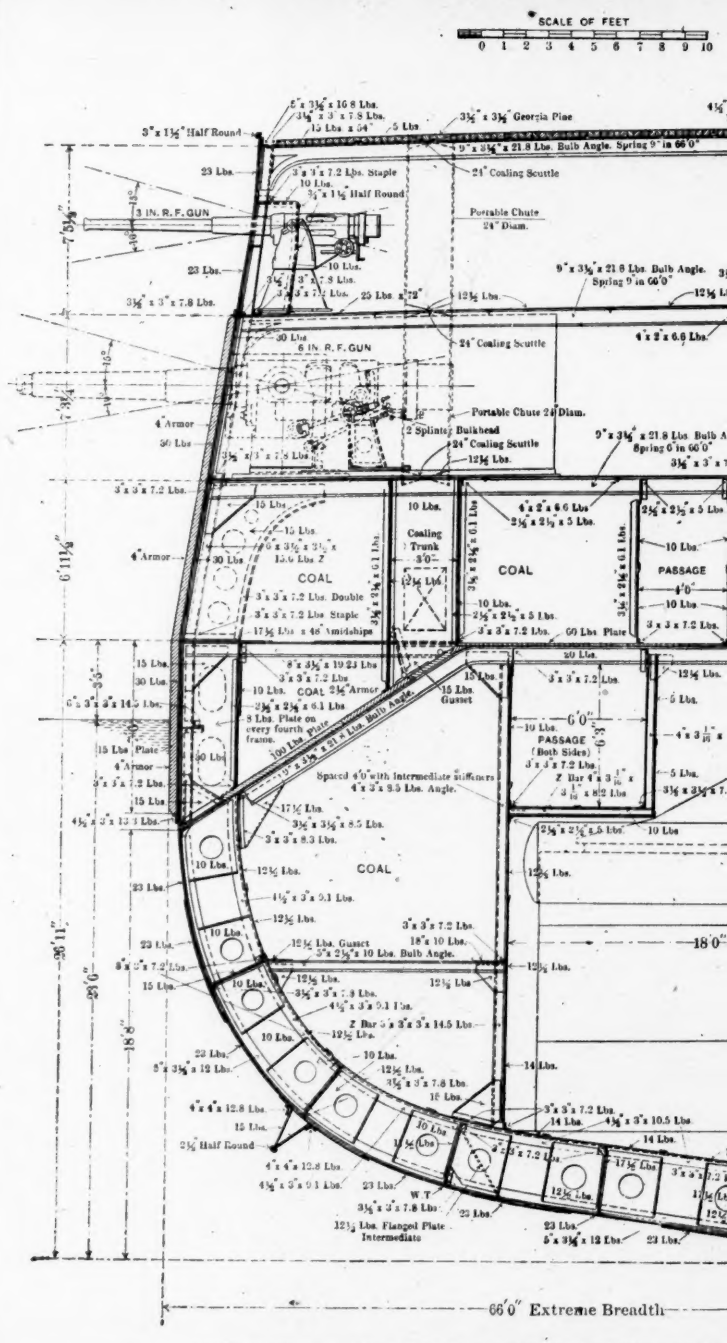
All the latest and best improvements in construction and equipment are to be provided for the accommodation and comfort of the officers and crew.

The water-line belt, 4 inches in thickness, extends in the wake of the engines and boilers and magazines for over one-third of the vessel's length, and reaches from several feet below to about 3 feet above the normal water-line. Side armour of the same thickness is carried up amidships to the main deck, and extends between and includes the forward and after 6-inch guns on the gun-deck. The 6-inch guns at the four corners of the superstructure are also protected by 4-inch armour.

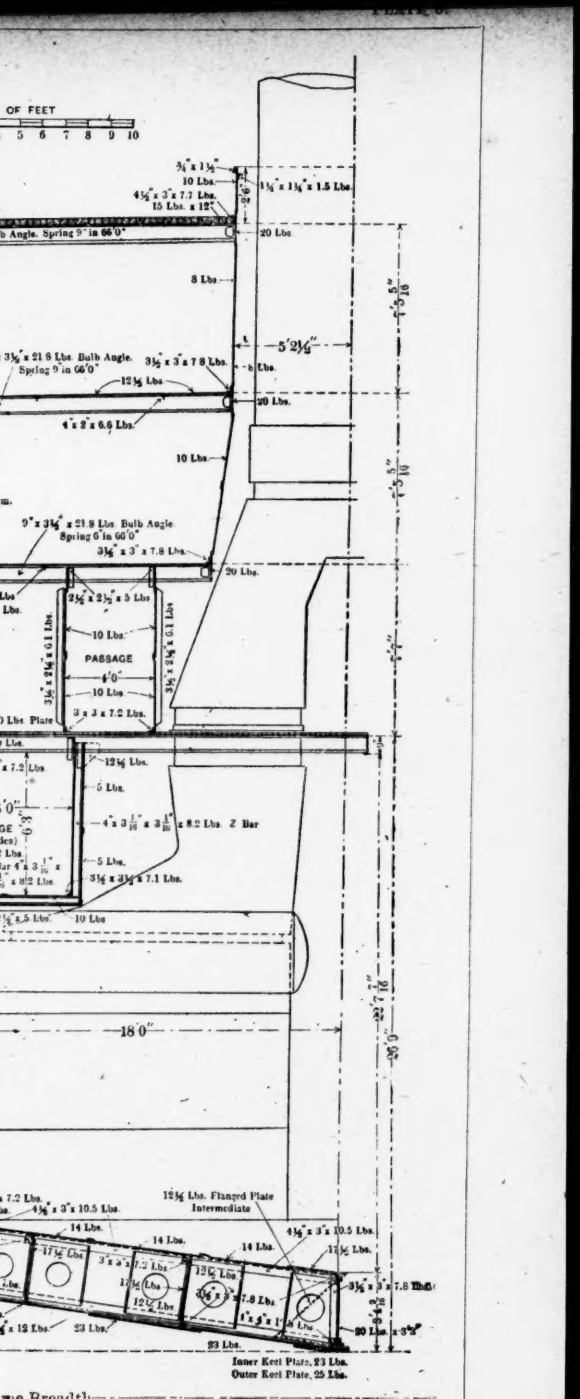
While we greatly admire these vessels, we must express a regret that the water-line armour was not carried up to the bow, even if some compromise had been necessary in the matter of coal or armament. This is an age of armoured cruisers (*i.e.*, ships with a complete water-line belt), and it is regrettable that these vessels should fall short of the requirements for want of the 120 feet of 2- to 3-inch armour necessary to complete the belt to the stem.

The corn-pith cellulose cofferdam at the water-line, with its water-excluding properties, will safeguard the trim and stability of the "St. Louis" against all but the smaller 6- and 14-pounder shells about as effectively as if the 2-inch belt were extended to the stem; but it will be just these very small calibre guns that will be used to search out and cut to pieces the unprotected ends of an enemy's water-line.

It must be admitted that the new ships, although they are not quite in the class of the armoured cruisers, are nevertheless more than a match for any protected cruiser afloat.—*Engineering*, *Scientific American*, and *Marine Engineer*.


SCALE OF FEET
0 1 2 3 4 5 6 7 8 9 10
3" x 1½" Half Round
5" x 3½" x 16.8 Lbs.
3½" x 3" x 7.8 Lbs.
15 Lbs. x 54"
5 Lbs.
3½" x 3½" Georgia Pine
9" x 3½" x 21.8 Lbs. Bulb Angle. Spring 9" in 66'0"
24" Coaling Scuttle
3 IN. R.F. GUN
Portable Chute 24" Diam.
23 Lbs.
3" x 3" x 7.2 Lbs. Staple
10 Lbs.
3½" x 1½" Half Round
10 Lbs.
3½" x 3" x 7.8 Lbs.
25 Lbs. x 72"
12½ Lbs.
6 IN. R.F. GUN
30 Lbs.
4" Armor
4" x 2" x 6.6 Lbs.
2 Splinter Bulkhead
12½ Lbs.
3" x 3" x 7.2 Lbs.
15 Lbs.
10 Lbs.
Coaling Trunk 3'0"
COAL
PASSAGE 4'0"
2½" x 2½" x 5 Lbs.
3½" x 2½" x 6.1 Lbs.
3" x 3" x 7.2 Lbs. Double
3" x 3" x 7.2 Lbs. Staple
17½ Lbs. x 48" Amidships
60 Lbs. Plate
3" x 3½" x 19.23 Lbs.
2½" x 2½" x 6.1 Lbs.
8 Lbs. Plate on every fourth frame.
10½ Lbs. 9" x 3½" x 21.8 Lbs. Bulb Angle.
15 Lbs. Gusset
6" x 3" x 14.5 Lbs.
15 Lbs. Plate
4" Armor
3" x 3" x 7.2 Lbs.
15 Lbs.
4½" x 3" x 13.3 Lbs.
Spaced 4'0" with Intermediate Stiffeners 4" x 3" x 8.5 Lbs. Angle.
17½ Lbs.
3½" x 3½" x 8.5 Lbs.
3" x 3" x 8.3 Lbs.
6'0"
PASSAGE (Both Sides)
3" x 3" x 7.2 Lbs.
Z Bar 4" x 3 1/16" x 3 1/16" x 9/32 Lbs.
2½" x 2½" x 5.5 Lbs.
12½ Lbs.
1½" x 3" x 9.1 Lbs.
3" x 3" x 7.2 Lbs.
18" x 10 Lbs.
5" x 2½" x 10 Lbs. Bulb Angle.
18'0"
Z Bar 5" x 3" x 3" x 14.5 Lbs.
14 Lbs.
3½" x 3" x 7.8 Lbs.
16 Lbs.
4" x 4" x 12.8 Lbs.
2½" Half Round
W T
12½ Lbs. Flanged Plate Intermediate
5" x 3½" x 12 Lbs.
23 Lbs.
22 Lbs.
14 Lbs.
4½" x 3" x 10.5 Lbs.
17½ Lbs.
12½ Lbs.
7'3½"
10'6"
7'3½"
6'11½"
3'6"
36'11"
25'0"
18'6"
66'0" Extreme Breadth

CROSS SECTION ST. LOUIS CLASS U. S. PROTECTED CRUISER—NOTE S



me Breadth

D CRUISER—NOTE SIDE ARMOR.

Reprinted from "Marine Engineering."

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING MARCH, 1901.

Colonel H. G. Dixon, C.B., A.D.C., from the 25th Regimental District (the King's Own Scottish Borderers) to be a Special Service Officer, Field Force, South Africa, graded as a Colonel on the Staff. Lieut.-Colonel J. M. Hunt (The Queen's Own Cameron Highlanders) is granted the temporary rank of Brigadier-General whilst acting in command of the Infantry Brigade, Gibraltar. Major-General M. W. Wilson, C.B., to be a Special Service Officer, Field Force, South Africa, graded as a Major-General on the Staff whilst so employed. Brevet Colonel R. M. Hyslop, from Lieut.-Colonel R.E., to be a Colonel on the Staff for Royal Engineers and to have the substantive rank of Colonel in the Army. Brevet Colonel G. Barker, from Lieut.-Colonel h.p. R.E., to be a Colonel on the Staff for Royal Engineers and to have the substantive rank of Colonel in the Army. Brevet Colonel W. Pitt, from Lieut.-Colonel R.E., to be a Colonel on the Staff for the Royal Engineers, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel and Brevet Colonel C. E. Heath, A.S.C., to be A.Q.M.G. at Head Quarters. To be Special Service Officers, Field Force, South Africa, graded as Major-Generals on the Staff, and to have the local rank of Major-General whilst so employed, viz :—Colonel (temporary Major-General) E. L. Elliot, C.B., D.S.O., I.S.C., now Inspector-General of Cavalry in India, and Lieut.-Colonel (temporary Colonel) S. B. Beatson, C.B., I.S.C., now Inspector-General of Imperial Service Troops in India. Lieut.-Colonel P. Bernard, Royal Malta Artillery, to be Colonel. Brevet Colonel W T. Shone, C.B., D.S.O., is granted the substantive rank of Colonel in the Army. Major (local Lieut.-Colonel) D. Haig, 7th Hussars, A.A.G., Cavalry Division, is granted the local rank of Colonel whilst employed on the Staff in South Africa. Major-General Sir B. Blood, K.C.B., R.E., to be a Special Service Officer, Field Force, South Africa, graded as a Major-General on the Staff whilst so employed. Major-General W. H. Mackinnon to be a Major-General on the Staff whilst commanding the Imperial Yeomanry at Aldershot. Colonel R. S. R. Fetherstonhaugh to be a Special Service Officer, Field Force, South Africa, graded as a Major-General on the Staff and to have the local rank of Major-General whilst so employed. Colonel G. H. Marshall resumes temporarily the appointment of Brigadier-General on the Staff to command the Royal Artillery at Aldershot, with the temporary rank of Major-General whilst so employed. Lieut.-Colonel J.Spens, the King's (Shropshire Light Infantry), to command an Infantry Brigade, South Africa, graded as a Colonel on the Staff and to have the local rank of Colonel whilst so employed. Major-General Lord Ralph Drury Kerr, C.B., to be Colonel of the 10th Hussars. Major-General and Hon. Lieut.-General W. K. McLeod, to be Colonel of the Highland Light Infantry. The King has been graciously pleased to approve of Hon. Colonel Francis Charles, Earl of Kilmorey, K.P., Shropshire Yeomanry Cavalry, being appointed A.D.C. to His Majesty for the service of his Yeomanry Force. His Majesty has been further pleased to confer on this officer the rank of Colonel in the Yeomanry Force. Lieut.-Colonel and Hon. Colonel the Right Hon. G. R. C. Lord Harris, G.C.S.I., G.C.I.E., Royal East Kent Yeomanry Cavalry, to be A.A.G. for Imperial Yeomanry, with the temporary rank of Colonel in the Army. General Sir A. P. Palmer, K.C.B., I.S.C., to be Commander-in-Chief of the Forces in the East Indies. Lieut.-Colonel and Brevet Colonel T. C. Porter, h.p., to be a Brigadier-General on the Staff to command a Cavalry Brigade, South Africa, and to have the local rank of

Brigadier-General whilst so employed. Lieut.-Colonel and Brevet Colonel M. C. Wood, Reserve of Officers, is graded as a Colonel on the Staff whilst commanding the Troops in Rhodesia. Colonel Sir R. C. Hart, V.C., K.C.B., is granted the temporary rank of Major-General whilst officiating in command of a First-Class District in India. Lieut.-Colonel P. H. Johnston, M.D., R.A.M.C., is granted the local rank of Colonel whilst in charge of a General Hospital in South Africa. Lieut.-Colonel A. T. Sloggett, R.A.M.C., is graded the local rank of Colonel in South Africa, whilst in charge of an Imperial Yeomanry Hospital. Lieut.-Colonel A. T. G. Richardson, the Prince of Wales' Volunteers (South Lancashire Regiment), to be Colonel. Brevet Colonel O. V. Boddy, from Lieut.-Colonel h.p. R.E., employed in the Public Works Department in India, is granted the substantive rank of Colonel in the Army.

HOME.—The Secretary of State for War recently gave, in the House of Commons, some details of the Government scheme for the re-organisation of the Army. The chief points of the reforms promised appear to be :—

A re-organisation of the system of commands, on the basis of being always ready to send abroad three army corps (120,000 men), and still have an efficient home defence.

For this purpose the country will be divided into six army corps by district :—

Ist	Army Corps	at Aldershot.
IInd	,,	on Salisbury Plain.
IIIrd	,,	in Ireland.
IVth	,,	at Colchester.
Vth	,,	at York.
VIth	,,	in Scotland.

Each corps will be equipped with cavalry and artillery, transport and stores, and commanded by officers who would lead them in war. This scheme is intended to centralise responsibility and decentralise administration.

Sixty battalions of Volunteers and Militia, carefully selected on special terms, will undergo special training with the Regular line. A certain number of field guns will be given to the Volunteers and Militia. These battalions will be included in the last three army corps.

Eight garrison battalions, composed of men of fourteen or twelve years' service, and under forty years of age, with an improved pension, will be formed to release the Army from some of the barrack duties.

The Militia are to be encouraged by full Army pay of an extra threepence a day. A Reserve of Militia will be established and the Militia Reserve abolished.

Under the title of the Imperial Yeomanry, a force of trained Yeomen is to be raised, armed with a shortened rifle and bayonet.

There will thus be added to the Army :—

50,000 trained Militia,
25,000 trained Yeomen,
40,000 trained Volunteers,

at a cost of under two millions sterling. The Army for home defence will consist of 680,000 men, made up as follows :—

155,000 Regulars,
160,000 Reserves,
150,000 Militia,
25,000 Yeomanry,
250,000 Volunteers.

INDIA.—The new tripod mounting for Maxim guns, which has been adopted for the Army in India, is ingeniously constructed. It is light yet strong, and with the gun itself forms a load for one mule. The principle has been adopted of splaying the legs of the tripod, so that the gun can be fired if necessary almost flush with the

ground. As we noticed some time ago, experience gained in South Africa showed that a Maxim fired in full view of the enemy at once attracted attention and drew both rifle and shell fire, making it almost impossible for the detachment in charge of the gun to continue its working. When, however, the plan was adopted of splaying the tripod and making as small a target as possible, the men being warned to serve the gun without even rising to their knees, the Boer fire proved ineffective. It was one of the Australian contingents which first showed how Maxims could be used in this way, and there were only trifling casualties among their gun detachments. The new tripod is now being made at the Cossipore factory and will eventually be served out to regiments in India entrusted with Maxims.—*The Pioneer Mail.*

AUSTRIA-HUNGARY.—In consequence of the changes made in the first programme of the grand manœuvres these will now be carried out by the IVth Army Corps (Buda-Pesth), the XIIIth Army Corps (Agram), the 48th, 71st, and 72nd Regiments of the Vth (Pressburg) and 4 battalions in garrison in the occupation districts, viz., the 3rd Bn. 34th, the 1st Bn. 68th, the 4th Bn. 70th, and the 2nd Bn. 82nd Regiments. The scene of the operations will lie in the south-west of Hungary, in the neighbourhood of Fünfkirchen, and will be under the supervision, as was before decided, of the Chief of the Staff, General Baron von Beck. The infantry units taking part in the grand manœuvres will call out, for a period of 20 days, a sufficient number of reservists and, if necessary, trained men of the Ersatz, to bring the company effectives up to 130 men. Infantry regiments not taking part in the manœuvres will call out 72 men per company for 13, 16, or 28 days.

Special instructions will regulate the cavalry manœuvres. Troops of this branch of the Service will call out their reservists for 28 days, between the 1st April and the conclusion of the grand manœuvres, so as to fill up, proportionately, the vacancies caused by men leaving the Service.

Artillery regiments will call out 185 men, divisional artillery regiments 142, mountain battery groups 100, and fortress artillery battalions 280 men.

Pioneer reservists will be called up, half at a time, on the 1st May and on the 1st August, for 13, 20, or 28 days; those of railway regiments and telegraphists for 13 or 28 days.

The medical corps will call out 2,950 men. Special instructions will regulate the assembly of reservists of the military transport.

It is recommended that agricultural labourers should, as far as possible, be called out when they are not required for the harvest.—*Vedette.*

ITALY.—The Minister of War has recently published a programme of the different manœuvres to be carried out by the Italian Army in 1901. It is as follows:—

1. *Field Manœuvres.*—Field manœuvres will take place, in accordance with the regulations at present in force, in all army corps, from the 1st to the 12th September. Exception is, however, made with regard to the troops in garrison in Sardinia; these troops will execute special manœuvres from the 10th to the 23rd June inclusive.

2. *Cavalry Manœuvres.*—These manœuvres will take place as follows:—

a. Three cavalry brigade camps will be formed, one in the Ist and one in the IIIrd Army Corps, from the 1st to the 20th September inclusive, and one in the VIIIth Army Corps from the 5th to the 25th September inclusive.

b. A cavalry divisional camp will be formed in the Vth Army Corps from the 5th to the 25th September inclusive.

c. Reconnoitring manœuvres will take place in the VIIIth and IXth Army Corps districts from the 25th August to the 6th September inclusive. The following regiments, which are about to change quarters, should take part in them, viz.: the 6th Aosta Lancers, the 10th Victor Emmanuel II. Lancers, the 22nd Catana Light Cavalry, and the 23rd Humbert I. Light Cavalry.

3. *Army Corps Cadres Manœuvres.*—These manœuvres will be carried out in the Ist, IIIrd, VIth, VIIIth, IXth, and XIth Army Corps.

4. *Siege Cadres Manœuvres* will take place in the IInd Army Corps.

5. *Cavalry Cadre Manœuvrès* will be held in the IInd and XIIth Army Corps, the 2nd and 8th Brigades taking part in them.

6. *Cavalry Instruction Ride* will be under the supervision of the Inspector-General of Cavalry, and will be carried out in accordance with special instructions from the Minister of War.

7. *Staff Ride* will be held under the direction of the Head-Quarter Staff. It will take place at a date fixed by the Chief of the General Staff and in accordance with instructions laid down by him.

In order to insure the participation of the largest possible proportion of artillery and engineer officers at the Siege Cadres Manœuvres, the Minister of War has arrived at the following decision :—

When manœuvres for the attack and defence of fortified places take place in certain army corps, selected each year in rotation, officers belonging to army corps in which these manœuvres do not take place will be nominated, in a proportion fixed by the Minister of War, to take part in these siege manœuvres, which will be directed by a major-general or a colonel, under the supervision of the commander of the army corps in whose district these manœuvres are carried out. The following will take part in these manœuvres :—Field officers and captains of artillery and engineers, field officers and captains of infantry, and also officers of the staff and a commissariat officer belonging to the army corps in whose district the manœuvres take place. The commander of the army corps, having the chief supervision of the manœuvres, will decide on the place for the theatre of operations, he will fix the date on which they will take place, he will nominate the director of the manœuvres, and determine the composition of the cadres. He will take care that neighbouring army corps taking part in these manœuvres will be represented by officers of all branches of the Service, and especially by a number of artillery and engineer officers proportionate to the number of officers of special branches of the Service included in every army corps.—*La France Militaire.*

PORTUGAL.—The troops which took part in the Autumn Manœuvres of 1900 were divided into two mixed brigades of the following composition, viz. :—

Northern Brigade.

2 squadrons.
2 batteries.
3 infantry regiments of 2 battalions each.
Medical and transport corps.

Southern Brigade.

2 squadrons.
2 batteries.
2 chasseur regiments of 3 battalions each.
Medical and transport corps.

The manœuvres took place near Beja in the country watered by the River Chelleiros, where the difficult task was assigned to the Northern Brigade of attacking the Southern Brigade in position on the left bank of the river, a task rendered doubly difficult on account of the greatly intersected nature of the country, which was cut up by deep and exceedingly steep defiles.

The execution of the manœuvres, according to the *Revista Militar*, revealed many faults, both as regards organisation and from a tactical point of view. That journal also finds fault with the great weight of the infantry soldier's equipment, which in service marching order weighs 32 kilogrammes (70½ lbs.), whilst practical experience shows

that the total weight carried by the man should never exceed 24 to 25 kilogrammes (53 to 55 lbs.). Consequently, the infantry had an unusual number of sick during the first few days' marches. The same may be said of the cavalry. The lancer regiments are light cavalry in name only. As a matter of fact, every single man is a regular arsenal, incapable both of scouting and of pursuit, as he can neither mount nor dismount expeditiously, a misfortune that proved a serious hindrance in the river fighting. In the same way, the horses were too heavily weighted, so that they suffered greatly from loss of power in a very few days. Further, neither the artillery nor medical department were sufficiently up to date, having regard to the armament of the infantry.

These and other faults, whose numbers might easily be dilated upon, render it peremptorily necessary that a regular scheme should be drafted, as soon as circumstances permit, for their removal and for the purpose of regulating the proper management of the finances, two most necessary measures. Above all the, for the most part, out-of-date regulations must be replaced by ones abreast with the times, more especially must the entire training be laid down upon suitable lines.

A saving might well be effected by the closing of the "Practical Schools" for the various arms, which, under their present organisation, entirely fail in their object. The Infantry School should be changed into a manœuvre camp, and the Artillery School into a practice ground, the Cavalry School could be entirely abolished, and the Engineering College restricted, in order that greater attention may be bestowed, in the final periods of training, to the completion of larger works. Every year two companies of infantry from each of the four divisions, a cavalry squadron, and a battery of artillery should march to their practice grounds in order to carry out field firing under active service conditions. At the same time the remaining squadrons could be exercised in field manœuvres. At the termination of their field firing the troops should be assembled to manœuvre against one another at approximate war strength. These manœuvres would be of the greatest use, and are, in fact, quite indispensable to the higher commanders and to their subordinates. Only by such, or similar, methods, can the training of the Army, as well as its preparedness for battle, be improved. The present system has just the contrary effect.—*Militär-Wochenblatt.*

ROUMANIA.—The *Monitorul Ostei*, of the 29th January last, published the "Regulation for Instruction in Military Cycling," of which the following are the principal provisions, viz. :—

Organisation and Recruiting.

Each regiment of infantry, cavalry, artillery, and engineers should raise a cyclist section in peace-time, recruited from amongst non-commissioned officers and men possessing, in addition to the necessary physical aptitude, a certain amount of general education. The mobilisation scheme will determine the number of cyclists to be attached to the different units and to the various branches of the Service in time of war.

Special Duty.

Cyclists are employed on orderly and reconnaissance duties. When the state of the roads and the nature of the ground permit, cyclists may replace or assist troopers as orderlies. At the same time, their chief *rôle* consists in connecting distant localities unprovided with telegraph or telephone service. When it is necessary for places to be in close communication, connecting posts of 2 or 3 cyclists are established, distant 15 to 20 kilometres from one another; when this is not so necessary, the strength of the posts is increased to 5 cyclists, and they may be as much as 40 kilometres apart. Important orders are entrusted, preferably, to officer cyclists. On the march cyclists are employed to connect the various columns. They may also assist to lighten the duties of the troopers forming the point of an advanced guard by transmitting the information collected. In camp cyclists are used: first, to keep up connection between the different outposts, and as visiting rounds; secondly, to send out patrols either alone, or in conjunction with other troops. For this purpose the companies of the advanced

guard should always have a certain number of cyclists at their disposal. The employment of cyclists is equally recommended for :—

a. Reconnaissance, and for the preparation of cantonments and bivouacs.
b. Special duties, such as the reconnoitring of positions, roads, bridges, fords, etc.
c. Establishing communication between lateral columns.

Instruction.

Cycling instruction is carried out, under the immediate supervision of the commander of the corps, by an officer, assisted if necessary by a civilian expert. The cyclist pupils form, according to the number of machines available, one or more squads. These are first practically and theoretically instructed in the mechanism of the bicycle itself. The squads are advanced, successively, to scouting and map-reading, then to training and preparing themselves for the various duties which may devolve upon a cyclist in the field. At first the training takes place on selected roads and may not extend for more than 1½ hours at a time. It is only when the pupils are sufficiently hardened that the exercises are conducted on any roads and across country, and may last for a period of 4 hours at most. The regulation marching pace varies from 14 to 15 kilometres an hour ; it may, nevertheless, be less on bad roads, and as much as 20 kilometres an hour may be done on good ones. Towards the middle of September the cyclist pupils undergo an examination consisting of a ride of 70 kilometres in conjunction with the execution of a tactical scheme. This examination is also open to men of the Territorial Army, who are in possession of a machine and who fulfil the necessary physical conditions.

Dress, Equipment, and Arms.

Cyclists wear the uniform of that branch of the Service to which they belong, with a distinctive badge of a bicycle in red cloth sewn on the left arm of the garment. At manœuvres and in the field cyclists are specially provided with the following articles, viz. :—1 comforter, 2 flannel shirts, 1 cloth jumper, and 1 linen one with a turn-down collar, 1 greatcoat and cape, 1 pair of waterproof leggings, 2 pairs of boots, 1 pocket-book for reports, 1 revolver and 30 cartridges, 1 dagger knife with belt, and a pair of field-glasses for non-commissioned officers only. The most necessary articles, viz., 1 flannel shirt, 1 pair of socks, 1 towel, and the rations, are carried in a case fixed on to the body of the machine. The valise, etc., is carried by the regimental transport.

Machine.

The bicycle is of the rigid type.

Allowances.

During the course of instruction the cyclist pupil is entitled to an addition to his rations on the days when he covers more than 50 kilometres. During manœuvres cyclists receives an allowance of 1 franc a day in lieu of the supplementary ration. Reservists called out as cyclists for the manœuvres, and who bring their machines with them, receive a detention allowance of 50 centimes for ordinary days, and of 1 franc for manœuvre days.

The regulation also states that officers being of equal merit, preference for promotion will be given to those who practise bicycling.

RUSSIA.—In the course of the year 1900 the constitution of the troops in the Far East has been greatly changed. Amongst the changes in their organisation, a certain number appear to have been dictated by the necessities of the moment, others have a permanent character, and may be regarded as final. Amongst the latter are the following :—

The staff of the Amour District has been changed by an order, No. 300, of 1900, which confers on it an organisation similar to that of other staffs of frontier districts, viz., 33 staff officers, 13 topographic officers, and 93 civil or military *employés*. The complete *personnel* of the command of the Amour District is normally composed of 60 officers, of whom 8 to 12 are general officers, 13 topographic officers, 26 classified functionaries, and of 191 civil or military *employés*.

The 2nd East Siberian Frontier Brigade was until recently formed of 5 frontier regiments of 2 battalions each. These corps have now all been transformed into rifle regiments of 2 battalions each, similar to those already existing in the Amour District, and have become the 13th, 14th, 15th, 16th, and 17th East Siberian Rifle Regiments. All the East Siberian frontier regiments (4 battalions of the 1st Frontier Brigade, and 2 independent battalions) have also been changed into rifle regiments of 2 battalions each, and have been numbered the 18th, 19th, 20th, 21st, 22nd, and 23rd. In addition, a 24th Rifle Regiment, similar to the others, has been raised. These 12 rifle regiments have been grouped in fours, in their numerical order, and now form the 4th, 5th, and 6th East Siberian Rifle Brigades. In addition, there have been formed :—

1. A mobile mortar park for the two mortar batteries of the 1st East Siberian Artillery Brigade.
2. A fortress infantry regiment of 4 battalions, of 4 companies, at Port Arthur ; the artillery sub-division of this place has been provided with a magazine with the necessary *personnel*.
3. A fortress infantry battalion of 5 companies at Nicolaiëvsk.
4. Two fortress artillery companies at Port Arthur, which brings the artillery effective of this place up to 8 companies.
5. Two battalions, reserve cadres, at Nertchinsk and Verkhnéoudinsk.

The 6 Vladivostok fortress artillery companies have been formed into 2 battalions of 3 companies each, these will later be increased to 4 companies.

Finally the 2 companies of the 3rd and 17th Engineer Battations, and the company of the 4th Pontoon Battalion, at present in the Amour District, have been formed into a 3-company battalion, called the 2nd East Siberian Engineer Battation, the battalion already existing taking the title of the 1st East Siberian Engineer Battalion. The troops already existing in this province, increased by units formed on mobilisation by those newly raised and by the troops brought from Europe, were utilised to form four army corps, called the 1st, 2nd, and 3rd Siberian Army Corps, and the Corps of Invasion. The two latter corps no longer exist, there only remain the 1st and 2nd Siberian Army Corps. The composition of the 1st Army Corps is known. That of the 2nd has not been made public by any official document. The troops of the Amour District, with the exception of units raised on mobilisation whose demobilisation is now being carried out (not including Kwang-tung) are however as follows :—

1st Siberian Army Corps.

1st, 2nd and 4th East Siberian Rifle Brigade.
Oussouri Cavalry Brigade.
1st East Siberian Artillery Brigade (8 batteries, 2 being mountain and 2 mortar).
1st Transbaïkal Cossack Horse Artillery Battery.
1st East Siberian Mobile Artillery Park.
East Siberian Mobile Motar Park.
1st East Siberian Engineer Battalion.
Detachment of fortress artillery from Novokiev.
Company of fortress miners from Novokiev.
Cadre transport company from Southern Oussouri.

2nd Siberian Army Corps, and troops additional to Army Corps.

Line Troops.

5th and 6th East Siberian Rifle Brigades.
Nertchinsk Cossack Cavalry Regiment.
Argousa " " "
Amour " " "
2nd East Siberian Artillery Brigade (4 batteries).
Group of Transbaïkal independent artillery (2 batteries).
2nd Transbaïkal Cossack Horse Artillery Battery.
2nd East Siberian Mobile Artillery Park.
2nd East Siberian Engineer Battalion (3 companies).
Oussouri Railway Battalion (6 companies).

Reserve Troops.

4 Reserve battalion cadres of Striétensk, Tchita, Nertchinsk, and Verkhnéoudinsk.

Fortress Troops.

Vladivostok—2 infantry fortress regiments (3 battalions each).
„ 2 fortress artillery battalions (provisionally of 3 battalions each).
„ 1 company of fortress engineers.
„ 2 companies of fortress miners.
„ 1 fortress balloon section.
Nikolaiëvsk—1 infantry fortress battalion (5 companies).
„ 1 fortress artillery company.
Novokiev — 1 fortress artillery detachment.
„ 1 company of fortress miners.

Kwang-tung.

The present organisation of Kwan-tung is rather peculiar. The commander of this province is at the same time civil governor, and commander-in-chief of the troops and military establishments in the province of Kwan-tung, and of the naval forces in the Pacific. In his civil capacity he has the same rights and powers as the governor of the Caucasus, but all his administration is dependent on the War Department; in his naval capacity he is directly responsible to the Minister of Marine; as a soldier he has the same powers as a district commander, and appears to be no longer under the orders of the officer commanding the Amour District, with whom he is allowed to communicate direct. At the same time the Yearly Report of 1900, published by the Minister of War, continues to include him, as well as the troops under his command, as forming a portion of the Amour District. To assist him, in addition to his civil administration, he has a deputy, a staff, and four departments, viz., the artillery, engineer, commissariat, and medical. The staff, of whom the chief is his deputy, consists of two sections, the military and the naval. All the Kwang-tung field troops are under the orders of the officer commanding the Rifle Brigade, who has the powers of a divisional commander, and is, at the same time, commandant of Port Arthur. The troops are:—

The 3rd East Siberian Rifle Brigade.
The Verkhnéoudinsk Cossack Cavalry Regiment.
Group of East Siberian Artillery (three batteries).
East Siberian Engineer Company.
A Section of the Oussouri Railway Battalion.

The troops at Port Arthur are:—

1. Infantry Fortress Regiment of four battalions.
2. Fortress Artillery Battalions of four companies each.—*Revue Militaire.*

SWITZERLAND.—The *France Militaire* publishes full particulars concerning the new Swiss field gun, and states that the Gun Committee rejected, after a series of trials, the Creusot and Ehrhardt guns with a long recoil, and adopted a Krupp gun, which is furnished with a spring connecting the spade at the end of the trail with a rod crossing from one cheek to the other half-way up their length. The spring is compressed by the recoil, and its expansion after the force of the recoil is spent carries the gun back to its first position. The lower part of the carriage is rigid. The upper part of the carriage, which bears the gun, turns horizontally on a pivot through an agle of 6°; the gun can be depressed 12° below the horizontal and 18° above it. The barrel and breach together weigh about 7 cwt.; with the carriage added, not quite 18 cwt.; and with the further addition of the limber, rather less than 33½ cwt. The whole is drawn by a team of six horses. Forty rounds are carried in the limber and 56 in the accompanying ammunition wagon. The latter, with its load, also weighs a little more than 33 cwt. The weight of the cartridge is 17½ lbs., the weight of the shell being 14 lbs., and that

of the charge rather more than 1 lb. The shrapnel shell contains about 240 balls. The muzzle velocity is 1,640 feet per second. The rate of firing is from nine to ten rounds per minute. The range is a little beyond 6,000 yards. The track is 4½ feet wide, and the axle is 3 feet above the ground. The calibre is 2·9 inches (75 millimetres), and the length 30 calibres. The gun is made of nickel steel.—*Times.*

UNITED STATES.—Instructions were promulgated on 26th March prescribing the kind and qualities of the component articles of the United States Army ration, and the kind and quality of substitutive equivalent articles, in place of any such components which cannot be issued. The rations allowed are divided under three heads, viz., garrison, field, and travelling rations. Pork is eliminated entirely in the new rations. The allowance of sugar in the garrison ration is increased to 20 lbs. per 100 rations over 15 in the old issue, and the vinegar component which was formerly $\frac{4}{5}$ of a gill, is changed by allowing half that amount in cucumber pickles when so desired. In the field ration, 12·5 ozs. of jam are allowed in the fruit component, in place of 13·5 ozs. of dried or evaporated fruit, the allowance for the garrison ration. Canned tomatoes will be served in the travel ration on the first day, instead of on the fourth as formerly. These are the principal changes.

Substitutive articles for the garrison ration are as follows :—Fresh mutton, bacon, canned meat, dried fish, pickled fish, canned fish, soft bread, hard bread, corn meal, peas, rice, hominy, potatoes, onions, canned tomatoes, fresh vegetables not canned, desiccated vegetables, apples, peaches, roasted and ground tea (black or green), vinegar, cucumber pickles. In the field ration the substituted articles are fresh mutton, canned meat, bacon, soft bread, hard bread, hops, dried or compressed yeast, rice, potatoes, onions, canned tomatoes, tea (black or green), vinegar, cucumber pickles. The standard articles of the travel ration are : Soft bread, canned corned beef, baked beans, canned tomatoes, coffee roasted and ground, sugar, and the substituted articles are hard bread and corned beef hash.

Food on transports for troops travelling will be prepared from the articles of subsistence stores, which compose the ration for troops in garrison, varied by the substitution of other articles of authorised subsistence stores of equal money value when required. No savings will be allowed to troops on transports.

An emergency ration, prepared under direction of the War Department, will be issued to troops on active campaign, but will not be used at any time or place where regular rations are obtainable. It will be packed in a conveniently shaped package, and will be carried in the haversack or saddle-bags and accounted for at inspection, etc., by the soldier.

Fresh meat will ordinarily be issued seven days in ten, and salt meat three days in ten. If fish (dried, pickled, or canned) is issued it will be in substitution for salt meat. The proportion of the meat issued may be varied at the discretion of the department commanders—not, however, without due consideration being given to the equitable rights of contractors engaged in furnishing fresh meats to the troops under their commands. Whenever the issue of both the fresh meat and vegetable components is impracticable, there may be issued in lieu of them canned-fresh-beef-and-vegetable stew, at the rate of 28½ ozs. to the ration.—*U.S. Army and Navy Journal.*

NAVAL AND MILITARY CALENDAR.

MARCH, 1901.

1st	(F.)	De Wet crossed the Orange River, but lost 200 men captured.
,,	,,	80 men of Kitchener Scouts surrendered after sustaining 20 casualties.
,,	,,	Army Estimates for £87,915,000 were issued.
4th	(M.)	Lord Kitchener reported that De Wet had been headed off from Phillipolis. More Boer guns and prisoners were captured.
5th	(T.)	Launch of first-class battle-ships "Montague" at Devonport and "Albemarle" at Chatham, and of first-class armoured cruiser "Drake" at Pembroke.
,,	,,	H.M.S. "Gibraltar" commissioned at Portsmouth for the Cape.
,,	,,	H.M.S. "Cambrian" commissioned at Devonport to relieve "Flora" on South-East Coast.
,,	,,	A Report of the Special Committee on the future of the Yeomanry was issued.
6th	(W.)	Launch of first-class armoured cruiser "Kent" at Portsmouth.
,,	,,	H.I.M. the German Emperor was injured at Bremen by a piece of iron thrown by a man named Dietrich Weiland.
7th	(Th.)	H.M.S. "Venus" paid off at Chatham from Mediterranean.
,,	,,	H.M.S. "Perseus" commissioned at Chatham for East Indies.
,,	,,	Delarey attacked the Lichtenberg garrison of 500 men.
8th	(F.)	H.M.S. "Phœbe" left Plymouth for Australia to relieve "Porpoise."
,,	,,	H.M.S. "Rattler" left Plymouth for the Cape.
,,	,,	Delarey's attack on Lichtenberg was repulsed and a Boer general killed.
,,	,,	General French captured two more guns and large supplies.
9th	(S.)	Two rebel train-wreckers were sentenced to death at De Aar.
,,	,,	The British Government declined to accept the United States Senate's amendment to the Hay-Pauncefote Treaty.
,,	,,	The Somali Mad Mullah was severely defeated by Abyssinian troops.
15th	(F.)	Lord Kitchener reported that General French had made more captures of prisoners and stock.
16th	(Sat.)	Colonel Park captured Abel Erasmus and a Boer laager at Kruger's Post.
20th	(W.)	H.M.S. "Gibraltar" left Plymouth for the Cape.
,,	,,	Three Boers were shot, after trial by court-martial, for train-wrecking.
,,	,,	Instructions were issued by the War Office for the training of Volunteers under the new scheme.
21st	(Th.)	Launch of first-class battle-ship "Duncan" from Thames Ironworks, Blackwall.
,,	,,	General P. Botha was killed at Doornberg, and his two sons wounded, and the Boers in the Orange River Colony disbanded and scattered.
22nd	(F.)	Launch of first-class armoured cruiser "Desaix" at St. Nazaire for French Navy.
23rd	(Sat.)	H.M. sloop "Fantôme" floated at Sheerness.
,,	,,	H.M.S. "Cambrian" sailed for South-East Coast.
25th	(M.)	General Babington severely defeated Delarey near Ventersdorp, and captured two 15-pounders, a pom-pom, six Maxims, a large quantity of ammunition, and 140 prisoners. British loss trifling.
26th	(T.)	H.M.S. "Mohawk" arrived at Plymouth from Australia.
30th	(S.)	Boer commandants Englebrecht and Prinsloo surrendered to the British.
,,	,,	300 men of the West African Regiment mutinied at Kumasi.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletin del Centro Naval.* Buenos Aires: February, 1901.—Has not yet been received.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 4. Pola: April, 1901.—"On the Practice of Modern Methods of Navigation." "Fresh Water Springs in the Harbour of Pola." "Masts and Sails as a Means of Training in Modern Navies." "An Apparatus for Avoiding Mistakes in Working Engines in Carrying out Orders from the Bridge." "The Speed of War-ships." "The Corinth Ship Canal." "A Mineral-Oil Buoy." "The Development in the Building of Ocean Steamers." "The Speed of Steamers in Foggy Weather." "Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: January, 1901.—"The Torpedo-Cruiser 'Patria.'" "The Argentine Military Club." "On the Clerk-Maxwell Theory." "Historical Studies: Some Considerations on Strategy and Tactics." "The Naval Hospital: Brazilian Naval Hospital Service." "Oil on the Sea: Its use for Smoothing the Waves." "Technical Observation on the Paris Exhibition." "Naval Notes."

FRANCE.—*Revue Maritime.* Paris: February, 1901.—"Study of the Variations of Displacement of a Ship Complying with Certain Imposed Conditions." "Capture of the Pei-Ho Forts." "Safety at Sea." "Neutrality of Fisheries and Fishing Coasts in Time of War." "Note on a Practical Method of Using Thompson's Sounding Tubes." "Regulation of the Speed of Steam Auxiliary Engines in Ships of War" (*continued*). "The New American 12-inch Gun." "Launch of the Austro-Hungarian Torpedo-Cruiser 'Szigetevar.'"; "Trials of the 'Garibaldi' and Launch of the 'Cataluna.'" "New Naval Establishments in the Argentine Republic." "Naval Notes." "The Mercantile Marine."

Le Yacht. Paris: 2nd March, 1901.—"The Manning of the Fleet in England." "Yachting Notes." "Launch of the Russian First-class Battle-ship 'Césarevitch.'" "The Mercantile Marine: French and Foreign." 9th March.—"The Proposed New Credits for Improving the Plants of the Dockyards." "Yachting Notes." "The English Third-class Cruiser 'Pactolus.'" 16th March.—"The Necessity for a Powerful Mercantile Marine." "Yachting Notes." "The Mercantile Marine: French and Foreign." 23rd March.—"The Shipbuilding Programme for 1901." "Yachting Notes." "Trials of the Submarine Boat 'Holland.'" "Nautical Astronomy and Yachting." 30th March.—"*À propos* of the English Naval Estimates." "Yachting Notes." "The U.S. Armoured Cruisers of the 'California' Type." "The Armoured Cruiser 'Desaix.'" "Naval Artillery *Matériel*." "The Mercantile Marine: French and Foreign."

Le Moniteur de la Flotte. Paris: 2nd March, 1901.—"Mercantile Marine Captains and the Cadre of Reserve Officers." "The Navy in Parliament." "Chinese Affairs." "The Italian Squadron at Toulon." 9th March.—"Mercantile Marine Captains and the Cadre of Reserve Officers." "The Administration and Control of the Dockyards." "The Navy in Parliament." "The Italian Squadron at Toulon." 16th March.—"Modern Artillery." "The Increase of the Fleet." "The English Naval Estimates." 23rd March.—"Advantages to Accrue to Reserve Officers." "The Navy

in Parliament." "English Ships under Construction." "Promotion among the Crews of the Fleet." 30th March.—"For Old Seamen." "The Boiler Commission in England." "The Navy in Parliament." "The Italian Squadron at Toulon."

La Marine Française. Paris: 15th March, 1901.—"Our Good Friends, our Enemies: An Answer to Mr. Arnold White." "The Question of Submarine Cables from the French Point of View." "Submarine Navigation and Submersible Torpedo-Boats." "The Accident to Torpedo-Boat 245." "The Defence of Corsica and the Discussion in the Senate."

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ITALY.—*Rivista Marittima.* Rome: March, 1901. — "Naval Tactics in History." "A Problem of Naval Cinematics." "The Basis of Naval Tactics." "Meteorology in the Nineteenth Century." Letters to the Director:—"Lateral Rolling Keels for Torpedo-boat Destroyers"; "On a New Probable Cause of Deviation in Ships' Compasses." "Naval Notes."

PORTUGAL.—*Rerista Portugueza, Colonial e Maritima.* Lisbon: February, 1901.—"Crown Colonies." "Colonial Agriculture" (*continued*). "On the Education of the Negro." "Troops for Foreign Service."

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FRANCE.—*Revue du Cercle Militaire.* Paris: 2nd March 1901.—"A Winter Reconnaissance by the 6th Battalion of Chasseurs" (*concluded*). "The Different Phases of Battle" (*continued*). "Taking of the Carnic Alps." 9th March.—"The Medical Statistics of the French Army for 1898." "Davout and Bernadotte at Auerstädt, the 13th and 14th October, 1806." "The Different Phases of Battle" (*concluded*). "The Second Centenary of the Russian Naval School." 16th March.—"The Visibility of Uniforms in the Field." "Davout and Bernadotte at Auerstädt, the 13th and 14th October, 1806" (*continued*). "Medical Gossip—Marsh-fever." 23rd March.—"Scheme of the German Law on Water-Ways: its Importance from a Strategic Point of View." "Davout and Bernadotte at Auerstädt, the 13th and 14th October, 1806" (*concluded*). 30th March.—"A General of Former Days—Henri de Rohan." "The Assault of Pekin by the Russian Troops, the 14th and 15th August, 1900" (with 2 sketches). "Equipment of Mounted Artillerymen."

Revue Militaire. Paris: March, 1901.—"The South African War, 1899-1900" (*continued*). "Military Events in China" (*continued*). "The Austro-Hungarian Manœuvres in 1900." "The 14th August, 1870, according to Cardinal von Widdern" (*continued*). "Russian Expansion in Siberia" (*continued*).

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Le Spectateur Militaire. Paris: 1st March, 1901.—"The South African War" (*continued*). "The Campaign of 1866" (2 sketches, *continued*). "The Ancient Corps of Marines" (*continued*). "The Campaign of 1809" (*continued*). 15th March.—"The South African War" (4 sketches, *continued*). "The Campaign of 1866" (1 sketch, *concluded*). "The Ancient Corps of Marines" (*continued*). "The Campaign of 1809" (*continued*).

Revue de Cavalerie. Paris: March, 1901.—"The German Cavalry at the Grand Manœuvres of 1900" (with map). "Cavalry Corps" (with 3 sketches, *continued*). "The Russian Cavalry in the War of 1877-78" (*continued*). "From Bautzen to Pläswitz" (*concluded*).

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Internationale Revue über die gesammten Armeen und Flotten. Dresden : March, 1901.—"Military and Naval News from Argentine, Brazil, Chili, Ecuador, France, Germany, Great Britain, Holland, Italy, Japan, Austria-Hungary, Orange, Free State, Roumania, Peru, Russia, Sweden, Switzerland, and United States." *French Supplement 24.*—"Russian Railways, chiefly in War." "The Pom-pom in the Transvaal War." "Torpedo-boat Trials in Germany." "Cordite." "Remarkable Resistance of a Krupp Gun against bursting" (with 3 plates).

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UNITED STATES.—*Journal of the Military Service Institution.* Governor's Island, N.Y., March 1901.—"Prize Essay—Organisation of the General Staff" (3). "Translations and Reprints." "Comment and Criticism." "Military Notes."

NOTICES OF BOOKS.

Life of Abdur Rahman, Amir of Afghanistan. By SULTAN MAHOMED KHAN. 2 vols. 8vo. London, 1900.

Excepting a claim that they are Israelites by descent, the Amir does not give the history of the Afghans beyond the reign of Ahmed Shah of the Abdali or Durani tribe (1747). It may be interesting, however, to trace it back further and to continue it to the present time. This has not been done by any previous critic—copiously as the book has been reviewed already—and may serve to a better understanding of the book itself.

Before his death (632) the Founder of Islam, besides bringing his own countrymen under his dominion, had commenced an attack on the Roman Empire. Twelve years later the whole of Persia was conquered and converted, and the Northern Frontier of the Arab Empire was advanced to the Oxus, including Balkh and the country north of the range of Hindu Kush.

The northern and middle portions of the tract are considered by Mr. Elphinstone as the original home of some important Afghan tribes, comprising the north-eastern portion of the Afghan nation, while the western tribes occupy the high table-land which is supported on the east by the mountains of Soliman, and separated by them

from the plains of the Indus. All these tribes remained unconquered till the time of the famous invader of India, Sultan Mahmud of Ghuzni (A.D. 1000). Uniformly victorious though he was, the Punjab was the only Indian territory he annexed to his kingdom.

In 1030 he died, and twenty years afterwards Ghuzni was taken and destroyed by the Ghorians, a war-like tribe from one of the mountain-ranges of Afghanistan, who followed up this success with such skill and ardour in India, that they may be deemed the founders of the Empire in that country which has lasted nearly to our time. From the dissolution of the Royal House of Ghor to the accession (1527) of Baber, the Moghul, lies a period of three hundred years, during which no less than three dynasties at Delhi were founded by Afghan courtiers or Afghan generals, namely, the House of Khilgi (1288-1321); the House of Toghlak (1321-1412); and the House of Lodi (1450-1526). In the course of his conquests preliminarily to his invasion of India, Baber acquired Kabul as early as 1506, and it was retained by his successors—hardly more than in name, however, after the death of Aurungzeb (1707)—till the invasion of Nadir Culi or Nadir Shah (1738), the greatest warrior Persia has ever produced.

Nadir was originally a shepherd on the banks of the Caspian Sea, then a free-booter, whence he raised himself to the throne of Persia (1736). His first step in that position was to recapture Khorasan and Kandahar, whence the Abdali and Ghilzie tribes of Afghanistan had recently expelled the Persians. Succeeding in this enterprise, he took possession of Kabul also, and so marched on to Delhi, where the opposing army was destroyed, the treasury emptied, the finances ruined. Shortly after his return to Persia he was assassinated, and the Afghans resumed their independence, selecting as their king one of their own chiefs, Ahmed Shah Durani, Nadir Shah's most trusted lieutenant.

Ahmed's eyes were early turned to India for conquest, money, and the training of his Army. In his third invasion (1756) he took Delhi, inflicting massacres and exactions as relentless as those perpetrated by Nadir Shah, his master. On his return for the fourth time, the Maratta power, then in its zenith, and eager to establish a Hindu sovereignty in India, suffered a crushing defeat by the invader on the fatal field of Paniput on 6th January, 1761. Ahmed might have mounted the throne of Delhi, but he left it in the hands of the expiring Moghul dynasty, and was the last Afghan invader of India. He died in 1773, after a reign of twenty-six years.

Timur, his son, succeeded him, at whose death in 1793 the crown was seized by his fourth son, Zeman Shah. It is unnecessary to enter into all the particulars of the wars that ensued amongst the brothers. Zeman defeated Mahmud in battle, imprisoned and blinded him. Again, Mahmud imprisoned Zeman. Then Shuja deposed Mahmud, and after a few years was himself deposed by that prince. At last the kingdom was rent asunder, the important principality of Kabul being secured by Dost Mahomed, a member of the same tribe as the great Ahmed Shah Durani, but of a different family.

It was against him that Lord Auckland declared war in 1839, with a view of restoring the exiled monarch Shuja, who, it was believed, would show his gratitude by furthering English interests in Afghanistan, and opposing those of Russia.

After capturing Kandahar and Ghuzni on the way, the British Army entered the City of Kabul without opposition. Everything seemed settled. Dost Mahomed a fugitive, and Shah Shuja on the throne under the guarantee of his own Army supported by our Protective Force. Suddenly in the winter of 1841, letters were circulated throughout the kingdom :—"To arms, ye Afghans! It is the intention of the English to seize your chief men and transport them to London." Generals Sale and Nott were equal to the occasion at Jellalabad and Kandahar, but at Kabul reckless mismanagement was followed by the gravest disasters. To these the Amir constantly points as indicative of the invincible prowess of his nation; he forgets to tell us of Sale and Nott, how they not only held their own, but sallied out and defeated the besiegers and finally, in conjunction with Pollock's relieving army, marched to Kabul, blew up its fortress, its bazaars, its public buildings, and its mosques.

We now come to the second and third Afghan Wars, with Lord Roberts our general in each. On our leaving the country in the autumn of 1842, Dost Mahomed returned to power, which he retained for the remainder of his life. He died in 1863; of his nine sons seven survived him, the eldest of whom was Afzul, father of the present Amir.

Shere Ali, however, succeeded to the throne. His conduct was always suspicious; at last in 1878 he practically declared himself ready to go to war with us. The two armies met, the Afghans were routed, Shere Ali fleeing to Balkh, releasing at the same time his son Yakub from prison, and leaving him as ruler of Kabul. Yakub gave up to the English the territories of Quetta, Khyber, Kuram, and Pishin. He also agreed to accept Sir Louis Cavagnari as our Ambassador at Kabul, where the gallant officer, with his staff and escort of Sikhs, was foully murdered by the Pathan soldiery on 3rd September, 1879. The Amir is inclined to attribute this lamentable event to the treachery of Daood Shah, the Afghan Commander-in-Chief. There is no truth in this, Daood Shah was cut down by his own soldiers as he mounted his horse and galloped towards them with orders to cease firing. We were introduced to him by Lord Roberts, then Commander-in-Chief of the Madras Army, on the Nilgiri Hills, where Daood Shah then lived in receipt of a small pension from the Government of India. Lord Roberts highly esteemed him; where he is now we do not know. Cavagnari's murder rendered the Third Afghan War inevitable. Yakub resigned, and was escorted to India, Abdur Rahman, the present Amir, accepting our suggestion that he should occupy the now vacant throne. All that remained to be done by us was to save Kandahar, which was besieged by the troops of Ayub, younger brother of the late Amir Yakub, flushed with their recent victory over General Burrows at Maimand. This was effected by Lord Roberts on the 1st September, 1880, at the close of his magnificent march from Kabul to Kandahar, 318 miles in 23 days without the loss of a man, in an army over 10,000 strong.

May this prove our last encounter with the brave warlike tribes of Afghanistan!

Projets et Tentatives de Débarquement aux Îles Britanniques. Par EDOUARD DESBRIÈRE, Capitaine breveté au I^er^ Cuirassiers. Vol. I.: 1793-1805. Published by the Historical Section of the French General Staff. Paris, 1900.

This volume forms the first of a series which is now being compiled by the Historical Section of the French General Staff from the hitherto unpublished reports and returns, etc., preserved in its archives, and its interest and importance to English readers can hardly be overrated.

The first section gives a *précis* of the most important of the many projects, official and unofficial, which reached the Directory previous to 1795. Many of them are wildly chimerical as to details, but all are characterised by the appreciation of the great strategic truth, that England can only be conquered by a victory on her own ground, and that the seizure of London would, in all cases, be a sure guarantee of a safe return—not one devoting a line to the question of retreat in case of failure.

This absolute recklessness of the consequences of defeat was, indeed, the central driving force of all Revolutionary strategy, and was as characteristic of Napoleon as of his equally daring but less capable forerunners, Kléber, Hoche, and others. When Bonaparte crossed the Alps into Austria and "bluffed" the truce of Leoben, his position with the Tyrol and al Italy behind, him seething with disaffection, was at least as precarious as that of a French Army in England if defeated, for in neither case could a single man of his forces hope to see his country again except by exchange of prisoners. Yet his narrow escape did not prevent his acceptance of similar risks again and again, notably in Egypt.

The poverty of the dockyards, and especially the want of administrative ability at the French Admiralty, however, defeated all the early attempts to get

together a sufficient force of vessels to make an attempt to break our blockading lines until 1796, when late in December (16th) a French fleet of 17 ships of the line, 15 frigates, and numerous smaller craft, having on board 15,000 men under the command of Hoche, took advantage of a favourable breeze and left port without, as far as they were aware, encountering either observation or hindrance from the British blockaders.

As a fact, afterwards established, H.B.M.S. "Indefatigable" had observed the sortie and had started off at once to report to the admiral, but the latter was not on the rendezvous, and, as far as the French were concerned, might as well have been at the bottom of the sea, for their fleet made the Irish coast, unmolested by anything except the weather, and remained there for 17 days, time enough to have executed their designs several times over, but unable, owing to the extraordinary contrariety of the wind, to combine any plan of action.

The details of this incident are profoundly interesting and well deserve study, and it is significant that in the nature of things not one of the causes which led to the fiasco applies to a modern fleet and disciplined army.

The British Fleet at Spithead received the news of the escape of the French Fleet from Brest on the 21st or 22nd December, but did not attempt to put to sea till the 25th, and on that day failed to get away because "the wind having changed to the south-west, the vessels could not fetch out of St. Helens." This is quoted from Mahan (p. 364). Actually the whole fleet did not get to sea till the 3rd January—the very day on which the last French vessel left Bantry Bay.

Whether 15,000 French assisted by rebellion could have held Ireland, and whether the retention of Ireland would have brought the war to a close, are questions for historians to decide; but it is very evident that French statesmen and amongst them men like Carnot, were fully convinced that both aims were practicable, and for us it is worth noting that the whole of this portion of the work eaves the impression on one's mind that its authors have been by no means converted to the doctrine of sea power, and consider that had the ships been propelled by steam the results would have been very different, as no doubt they would have been on both sides.

Shortly after the return of the expedition Hoche joined the army of the "Sambre et Meuse." "L'Armée d'Angleterre" was decreed to be formed by detachments from the army of Italy and the "Sambre et Meuse" and Desaix appointed to the chief command *pro temp.*, pending the arrival of Bonaparte, for whom it was eventually destined. More money and more energy were now thrown into the work of the dockyards, and it appeared for the moment as if at last all difficulties would be overcome. This part of the work deserves the closest attention, the details of the preparations which extended from the Texel to Brest are most interesting, and it is very evident whence the writer in *Les Deux Mondes* and General Mercier have derived their inspiration. The fleets of fishing boats and steam pinnaces are no new ideas, but absence of good communications and the general disorder in the administrative services again proved insuperable, and when Bonaparte at length arrived on the coast it became evident to him after a reconnaissance lasting some 15 days that it would be impossible to get the men and ships together in time; and though preparations continued for some weeks after, it is clear that he had abandoned the idea—they were only intended as a blind to cover other designs on Egypt.

The value of the book lies in the light it sheds as to the working of the French military mind, which refuses obstinately to accept our standpoint of sea power. Study it carefully, eliminating the local and special conditions due to the breakdown of administration due to the Revolution, the consequent penury of the great naval arsenals, the want of telegraphic and railway communications, and the fact that all preparations had to be made during actual hostilities, and one can well understand the tendency which of late has been so evident to reconsider the problem in the light of modern inventions.

The French never lose sight of the fact that nowadays their internal communications are secure, and the combinations of squadrons from Toulon, Brest, and Cherbourg can be arranged by wire ; further, that the choice of time is in their hands, and that these are no mean advantages in the struggle with fleets with whom communication may at any time be subject to all the uncertainties of fog or other weather—a point of view we too often neglect.

Military Law Made Easy. By Major S. T. BANNING, 1st Battalion Royal Munster Fusiliers. Aldershot : Messrs. Gale and Polden. 4s. 6d.

This work has been compiled by the author with a view of assisting officers to pass in Subject C. for their promotion examinations, and the book is well adapted for that purpose. In all cases reference is given for every statement, so that candidates may verify them for themselves, and so acquire familiarity with the subject, and also facility in looking up references for themselves. At the end of each chapter questions and answers are given on the subject-matter taken from papers set at the R.M.C. from July, 1895, to December, 1900, and the appendix contains papers on military law given at the last three examinations, fully answered and with references to the official books. Major Banning's book is a most useful one and should prove valuable to officers presenting themselves for promotion examinations.

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